T S5/9/9

5/9/9 (Item 4 from file: 15)

01742590 03-93580

All-in-one solutions

Uhlman, Ken

Buildings v92n12 PP: 22 Dec 1998 ISSN: 0007-3725 JRNL CODE: BLD
DOC TYPE: Journal article LANGUAGE: English LENGTH: 1 Pages
WORD COUNT: 687
GEOGRAPHIC NAMES: US

DESCRIPTORS: Facilities management; Systems integration; Building automation
CLASSIFICATION CODES: 5100 (CN=Facilities management); 5240 (CN=Software & systems); 9190 (CN=United States); 9000 (CN=Short Article)

ABSTRACT: Traditionally, the design and operation of individual building systems - electrical; communications; lighting; heating, ventilating, and air-conditioning; and security - were independent processes. Advancements in hardware and software technology and a better understanding of the interrelationship between system functions have resulted in an exciting new concept: integrated system solutions.

TEXT: Headnote:
Integrated systems drive the future of building system design.

Traditionally, the design and operation of individual building systems --electrical; communications; lighting; heating, ventilating, and air-conditioning (HVAC); and security - were independent processes. Little thought was given to why or how the various functions in a building can be integrated to work together. Until now.

Advancements in hardware and software technology and a better understanding of the interrelationship between system functions have resulted in an exciting new concept that is driving the future of building system design: integrated system solutions. Integrated systems provide a wide range of benefits not only for building owners, but also for occupants.

The concept of integrated building systems involves coordinating, unifying, and tying together all of the electrical distribution, control, and communications functions in a facility. It's a solution that can benefit buildings of any size or complexity. Integrated systems can tie together the functions of any number of facilities. As a result, enterprise-wide interoperability is achieved, sometimes from a single control point.

Enterprise-wide integrated solutions monitor and control several functions: interior, exterior, and display lighting; HVAC; metering (not only of power for functions such as lighting, HVAC, and the entire building, but also for gas, water, steam, and effluent); security; building **monitoring** (indoor air and power quality); and a number of other systems, such as **customer** counts, **movement** in a **store** , and point of sale.

The benefits of integrating building systems are significant, including lowering energy costs by reducing consumption and avoiding demand charges. An example of an integrated system is a building with lighting control that imperceptibly brightens or dims lighting by factoring in the amount of natural sunlight coming into a room. This control benefits the HVAC system

by lightening the load, resulting in lower energy consumption and often demand charges. Often, this only requires a few simple sensors and controllers, which can save enough electricity to pay back the cost in a year.

With interoperability, it is entirely feasible to shed loads when rates are highest, or when demand is approaching its upper limit. This ability to shed and add loads will become increasingly important as prices for energy fluctuate more widely by time of day - a possible result of deregulation. This ability will also allow some facilities owners to negotiate uninterruptible rates. Other advantages of integrated systems include the ability to provide increased security and safety for facilities, as well as the people who occupy them. Higher levels of comfort and peace of mind for occupants mean less downtime. Another benefit is increased uptime for facilities. Integrated systems can be prewired to reduce wiring and other installation errors that often plague facilities owners and managers during commissioning and initial operations. Additionally, a more compact installation is possible in many cases. A two-section switchboard, equipped with remote-controlled breakers, can replace a large switchboard and a number of subpanels.

Consider chain stores, where integrated systems offer enterprise-wide interoperability. Often, building systems can be monitored from a single PC. From this PC, energy usage from each store can be monitored and compared, providing an opportunity to identify areas where costs can be reduced. Security systems can be linked into integrated systems. At the same time, customers can be **tracked** to determine where they go first, and the average amount spent. Using valuable information, stores configure space to move more product.

In a competitive society, and especially in the competitive environment established by a deregulated energy marketplace, interoperability of a facility's functions is critical for optimal profitability.
Sidebar:

Enterprise-wide integrated solutions Control interior, exterior, and display lighting.

Sidebar:

Control heating ventilating and air-onditioning (HVAC) systems. Meter power usage for lighting and HVAC systems, as well as gas, water, steam, and effluent.

Sidebar:

* Monitor security systems. Monitor building indoor air and power quality.

Oversee customer counts, movement within a store, and pointof-sale timing.
:e f

Sidebar:

if or More Information For more information on a variety of electrical and wiring products, circle or write in Inquiry No. 706 on the Free Product Information Card page 65.

Author Affiliation:

Ken Uhlman is manager of the retail facilities segment at Cutler-Hammer,

Pittsburgh

?

Welcome to DialogClassic Web(tm)

```
 Dialog level 05.08.03D
Last logoff:  14jul05 10:38:15
Logon file405 05nov05 20:40:10
          *** ANNOUNCEMENT ***
                    ***
--UPDATED: Important Notice to Freelance Authors--
See HELP FREELANCE for more information
                    ***
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***Inspec (File 202)
***Physical Education Index (File 138)
***Computer and Information Systems Abstracts (File 56)
***Electronics and Communications Abstracts (File 57)
***Solid State and Superconductivity Abstracts (File 68)
***ANTE: Abstracts in New Technologies (File 60)
                    ***
RELOADS COMPLETED
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***ERIC (File 1)
                    ***
Chemical Structure Searching now available in Prous Science Drug
Data Report (F452), Prous Science Drugs of the Future (F453),

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  1.  Announcements (new files, reloads, etc.)
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      /H = Help            /L = Logoff          /NOMENU = Command Mode


Enter an option number to view information or to connect to an online
 service.  Enter a BEGIN command plus a file number to search a database
(e.g., B1 for ERIC).
?

BEGIN IGOR705
>>>          77 does not exist
>>>         233 does not exist
>>>2 of the specified files are not available
       05nov05 20:40:41 User268082 Session D76.1
            $0.00    0.328 DialUnits FileHomeBase
     $0.00  Estimated cost FileHomeBase
     $0.13  INTERNET
     $0.13  Estimated cost this search
     $0.13  Estimated total session cost   0.328 DialUnits

SYSTEM:OS  - DIALOG OneSearch
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  File   2:INSPEC 1898-2005/Oct W5
         (c) 2005 Institution of Electrical Engineers
*File   2: Archive data back to 1898 has been added to File 2.
  File   9:Business & Industry(R) Jul/1994-2005/Nov 04
         (c) 2005  The Gale Group
  File  15:ABI/Inform(R) 1971-2005/Nov 05
         (c) 2005 ProQuest Info&Learning
  File  16:Gale Group PROMT(R) 1990-2005/Nov 07
         (c) 2005 The Gale Group
  File  20:Dialog Global Reporter 1997-2005/Nov 05
         (c) 2005 Dialog
  File  35:Dissertation Abs Online 1861-2005/Oct
         (c) 2005 ProQuest Info&Learning
  File  65:Inside Conferences 1993-2005/Oct W5
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  File  99:Wilson Appl. Sci & Tech Abs 1983-2005/Oct
         (c) 2005 The HW Wilson Co.
  File 148:Gale Group Trade & Industry DB 1976-2005/Nov 07
         (c)2005 The Gale Group
  File 160:Gale Group PROMT(R) 1972-1989
         (c) 1999 The Gale Group
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         (c) 2005 Info.Sources Inc
  File 275:Gale Group Computer DB(TM) 1983-2005/Nov 04
         (c) 2005 The Gale Group
  File 347:JAPIO Nov 1976-2005/Jul(Updated 051102)
         (c) 2005 JPO & JAPIO
  File 348:EUROPEAN PATENTS 1978-2005/Oct W04
         (c) 2005 European Patent Office
  File 349:PCT FULLTEXT 1979-2005/UB=20051103,UT=20051027
         (c) 2005 WIPO/Univentio
  File 474:New York Times Abs 1969-2005/Nov 04
         (c) 2005 The New York Times
  File 475:Wall Street Journal Abs 1973-2005/Nov 04
         (c) 2005 The New York Times
  File 476:Financial Times Fulltext 1982-2005/Nov 06
         (c) 2005 Financial Times Ltd
  File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
         (c) 2002 The Gale Group
*File 583: This file is no longer updating as of 12-13-2002.
  File 610:Business Wire 1999-2005/Nov 05
         (c) 2005 Business Wire.
*File 610: File 610 now contains data from 3/99 forward.
Archive data (1986-2/99) is available in File 810.
  File 613:PR Newswire 1999-2005/Nov 04
         (c) 2005 PR Newswire Association Inc
*File 613: File 613 now contains data from 5/99 forward.
Archive data (1987-4/99) is available in File 813.
  File 621:Gale Group New Prod.Annou.(R) 1985-2005/Nov 07
         (c) 2005 The Gale Group
  File 624:McGraw-Hill Publications 1985-2005/Nov 04
         (c) 2005 McGraw-Hill Co. Inc
*File 624: Homeland Security & Defense and 9 Platt energy journals added
Please see HELP NEWS624 for more
  File 634:San Jose Mercury  Jun 1985-2005/Nov 04
         (c) 2005 San Jose Mercury News
  File 636:Gale Group Newsletter DB(TM) 1987-2005/Nov 07
         (c) 2005 The Gale Group
  File 810:Business Wire 1986-1999/Feb 28
         (c) 1999 Business Wire
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  File 813:PR Newswire 1987-1999/Apr 30
         (c) 1999 PR Newswire Association Inc

      Set  Items  Description
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BEGIN 705IGOR
>>>"705IGOR" is not a valid category or service name
>>>No valid files specified
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B IGOR705\
>>>"IGOR705\" is not a valid category or service name
>>>No valid files specified
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B IGOR705
>>>          77 does not exist
>>>         233 does not exist
>>>2 of the specified files are not available
       05nov05 20:41:29 User268082 Session D76.2
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     $0.11  Estimated cost File2
            $0.07    0.014 DialUnits File9
     $0.07  Estimated cost File9
            $0.07    0.014 DialUnits File15
     $0.07  Estimated cost File15
            $0.07    0.014 DialUnits File16
     $0.07  Estimated cost File16
            $0.01    0.014 DialUnits File20
     $0.01  Estimated cost File20
            $0.06    0.014 DialUnits File35
     $0.06  Estimated cost File35
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     $0.08  Estimated cost File348
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            $0.01    0.014 DialUnits File476
     $0.01  Estimated cost File476
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    $0.01  Estimated cost File610
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    $0.01  Estimated cost File613
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    $0.07  Estimated cost File621
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    $0.08  Estimated cost File624
        $0.01    0.014 DialUnits File634
    $0.01  Estimated cost File634
        $0.07    0.014 DialUnits File636
    $0.07  Estimated cost File636
        $0.01    0.014 DialUnits File810
    $0.01  Estimated cost File810
        $0.01    0.014 DialUnits File813
    $0.01  Estimated cost File813
        OneSearch, 27 files,  0.374 DialUnits FileOS
    $0.21  INTERNET
    $1.73  Estimated cost this search
    $1.86  Estimated total session cost   0.701 DialUnits

SYSTEM:OS  - DIALOG OneSearch
  File   2:INSPEC 1898-2005/Oct W5
         (c) 2005 Institution of Electrical Engineers
 *File   2: Archive data back to 1898 has been added to File 2.
  File   9:Business & Industry(R) Jul/1994-2005/Nov 04
         (c) 2005  The Gale Group
  File  15:ABI/Inform(R) 1971-2005/Nov 05
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  File  16:Gale Group PROMT(R) 1990-2005/Nov 07
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  File  20:Dialog Global Reporter 1997-2005/Nov 05
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         (c) 2005 The HW Wilson Co.
  File 148:Gale Group Trade & Industry DB 1976-2005/Nov 07
         (c)2005 The Gale Group
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  File 256:TecInfoSource 82-2005/Jan
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  File 348:EUROPEAN PATENTS 1978-2005/Oct W04
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        (c) 2002 The Gale Group
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 *File 610: File 610 now contains data from 3/99 forward.
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 *File 613: File 613 now contains data from 5/99 forward.
Archive data (1987-4/99) is available in File 813.
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  File 624:McGraw-Hill Publications 1985-2005/Nov 04
        (c) 2005 McGraw-Hill Co. Inc
 *File 624: Homeland Security & Defense and 9 Platt energy journals added
Please see HELP NEWS624 for more
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  File 810:Business Wire 1986-1999/Feb 28
        (c) 1999 Business Wire
  File 813:PR Newswire 1987-1999/Apr 30
        (c) 1999 PR Newswire Association Inc

      Set  Items  Description
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TRACK??? (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR OR SUBSCRIBER) (W) (STORE
>>>'RACK???' not allowed in command
?

TRACKING (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR OR SUBSCRIBER) (W) (STORE
>>>'RACKING' not recognized as set or accession number
?

S TRACKING (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR OR SUBSCRIBER) (W) (STO
Processing
Processed  10 of  27 files ...
Completed processing all files
         1050017  TRACKING
         6523227  CUSTOMER
         5731616  CONSUMER
          177829  PURCHASER
          260239  VISITOR
          641403  SUBSCRIBER
         3321761  STORE
         2025797  SHOPPING
      S1       3  TRACKING (W) (CUSTOMER OR CONSUMER OR PURCHASER OR
                  VISITOR OR SUBSCRIBER) (W) (STORE OR SHOPPING )
?

T 1/3,K/1-3

  1/3,K/1     (Item 1 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2005  The Gale Group. All rts. reserv.

00761561  Supplier Number: 23277079    (USE FORMAT 7 OR 9 FOR FULLTEXT)
```

Business Credit Card Tested by Wegmans
(Wegmans Food Markets is testing a new credit card aimed at business customers and that is integrated with firm's electronic frequent shopper program)
Supermarket News, p 11
August 21, 1995
DOCUMENT TYPE: Journal ISSN: 0039-5803 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 378

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...commercial customers. The chain has been capturing transaction data at the point of sale and **tracking consumer shopping** patterns since 1990.

"It will be going through a test market protocol for several more...

1/3,K/2 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2005 The Gale Group. All rts. reserv.

03960242 Supplier Number: 45739570 (USE FORMAT 7 FOR FULLTEXT)
Business Credit Card Tested by Wegmans
Supermarket News, p11
August 21, 1995
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 385

... commercial customers. The chain has been capturing transaction data at the point of sale and **tracking consumer shopping** patterns since 1990.
'It will be going through a test market protocol for several more...

1/3,K/3 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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08097867 SUPPLIER NUMBER: 17224499 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Business credit card tested by Wegmans. (Wegmans Food Markets Inc.)(Brief Article)
Zimmerman, Denise
Supermarket News, v45, n34, p11(2)
August 21, 1995
DOCUMENT TYPE: Brief Article ISSN: 0039-5803 LANGUAGE: English
RECORD TYPE: Fulltext
WORD COUNT: 408 LINE COUNT: 00036

... commercial customers. The chain has been capturing transaction data at the point of sale and **tracking consumer shopping** patterns since 1990.
"It will be going through a test market protocol for several more...
?

S MONITORING (W) MOVEMENT (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR OR SUBS
2754838 MONITORING
2143035 MOVEMENT

```
         6523227  CUSTOMER
         5731616  CONSUMER
          177829  PURCHASER
          260239  VISITOR
          641403  SUBSCRIBER
         3321761  STORE
         2025797  SHOPPING
      S2       0  MONITORING  (W) MOVEMENT (W) (CUSTOMER OR CONSUMER OR
                  PURCHASER OR VISITOR OR SUBSCRIBER) (W) (STORE OR
                  SHOPPING )
?

S MONITORING  (50) MOVEMENT (50) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR OR SU
               0  MONITORING  (50) MOVEMENT (50) (CUSTOMER
         5731616  CONSUMER
          177829  PURCHASER
          260239  VISITOR
               0  SUBSCRIBER) (50) (STORE
               0  SHOPPING )
      S3 6121674  MONITORING  (50) MOVEMENT (50) (CUSTOMER OR CONSUMER OR
                  PURCHASER OR VISITOR OR SUBSCRIBER) (50) (STORE OR
                  SHOPPING )
?

S MONITORING  (N50) MOVEMENT (N50) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR OR
Processed  10 of  27 files ...
Processing
Completed processing all files
         2754838  MONITORING
         2143035  MOVEMENT
         6523227  CUSTOMER
         5731616  CONSUMER
          177829  PURCHASER
          260239  VISITOR
          641403  SUBSCRIBER
         3321761  STORE
         2025797  SHOPPING
      S4     237  MONITORING  (N50) MOVEMENT (N50) (CUSTOMER OR CONSUMER OR
                  PURCHASER OR VISITOR OR SUBSCRIBER) (50N) (STORE OR
                  SHOPPING )
?

S S4 AND TRACK???
             237  S4
         4557226  TRACK???
      S5     118  S4 AND TRACK???
?

S (DELIVER??? OR TRANSPORT??? OR SEND??? OR BRING???) (W) (ITEM? OR PRODUCT$1 OR GRO
T OR CASHIER OR REGISTER)
Processing
Processed  10 of  27 files ...
Processing
Processed  20 of  27 files ...
Processing
Completed processing all files
         9267606  DELIVER???
         3312882  TRANSPORT???
         3246187  SEND???
         7779505  BRING???
```

```
        3234091  ITEM?
              0  PRODUCT$1
         120416  GROCERIES
        3059339  GOODS
        1679134  TERMINAL
         171466  POS
          81639  CHECKOUT
          37665  CASHIER
        1299835  REGISTER
     S6       0  (DELIVER??? OR TRANSPORT??? OR SEND??? OR BRING???) (W)
                 (ITEM? OR PRODUCT$1 OR GROCERIES OR GOODS) (W) (TERMINAL
                 OR POS OR CHECKOUT OR CASHIER OR REGISTER)
?


Set     Items   Description
S1          3   TRACKING (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR
             OR SUBSCRIBER) (W) (STORE OR SHOPPING )
S2          0   MONITORING  (W) MOVEMENT (W) (CUSTOMER OR CONSUMER OR PURC-
             HASER OR VISITOR OR SUBSCRIBER) (W) (STORE OR SHOPPING )
S3    6121674   MONITORING  (50) MOVEMENT (50) (CUSTOMER OR CONSUMER OR PU-
             RCHASER OR VISITOR OR SUBSCRIBER) (50) (STORE OR SHOPPING )
S4        237   MONITORING  (N50) MOVEMENT (N50) (CUSTOMER OR CONSUMER OR -
             PURCHASER OR VISITOR OR SUBSCRIBER) (50N) (STORE OR SHOPPING )
S5        118   S4 AND TRACK???
S6          0   (DELIVER??? OR TRANSPORT??? OR SEND??? OR BRING???) (W) (I-
             TEM? OR PRODUCT$1 OR GROCERIES OR GOODS) (W) (TERMINAL OR POS
             OR CHECKOUT OR CASHIER OR REGISTER)
?

S S5 AND (MOBILE (W) DEVICE)
Processing
Processed  10 of  27 files ...
Completed processing all files
             118  S5
         3218742  MOBILE
         6134142  DEVICE
           49828  MOBILE(W)DEVICE
      S7       1  S5 AND (MOBILE (W) DEVICE)
?

T S7/3,K/1

  7/3,K/1     (Item 1 from file: 634)
DIALOG(R)File 634:San Jose Mercury
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10804018
 CHIP THAT CAN TRACK YOUR EVERY MOVE TO BE UNVEILED TODAY WILL PRIVACY
 RISKS OUTWEIGH BENEFITS?
San Jose Mercury News (SJ) - Monday, October 30, 2000
By: ANICK JESDANUN, Associated Press
Edition: Morning Final  Section: Business Monday  Page: 17E
Word Count: 764

 CHIP THAT CAN TRACK YOUR EVERY MOVE TO BE UNVEILED TODAY WILL PRIVACY
 RISKS OUTWEIGH BENEFITS?

TEXT:
Location  tracking , coming to a mobile   device near you, will be able
```

to pinpoint your whereabouts to within 100 yards, raising enormous...

...to virtual stalking.

Cell phones, handheld devices, even car navigation systems will soon have detailed **tracking** abilities, if they do not already. Services could begin appearing within a year or so...

...to make money?

''There's going to be a dramatic increase in the amount of **tracking** that's made possible, in part by services they don't know they have,'' said ...

... Weitzner of the World Wide Web Consortium, which sets technical standards for the Web.

Such **tracking** will let someone visit a Web site and automatically get weather, movie showings or neighborhood...

...can be pointed to the nearest bank machine.

But if the information is stored, location **tracking** could result in a 24-hour-a-day record of a person's whereabouts.

So...

...social service agent wants to know how many times a person has visited a candy **store** with their child?

''You have to ask, 'Who gets how much information?' '' said Jason Catlett, chief executive of Junkbusters Corp., a non-profit privacy **monitoring** group in Green Brook, N.J.

''Telephone records are routinely subpoenaed. They can be very intrusive, but far more intrusive is a complete log of your physical **movement** .''

But companies looking to gain business from location **tracking** insist that the worst-case scenarios presented are impractical to implement in reality.

''There's...

... for Starbucks to monitor everyone's location on the off chance they can acquire a **customer** ,'' said Jason Devitt, chief executive of Vindigo, which offers 11 city guides through Palm organizers...

...it right the first time.''

In many ways, a person's whereabouts are already being **tracked** .

Employee security cards record when people enter buildings. Discount grocery programs **track** what people buy, where and when. Electronic toll-payment systems know when someone traverses a...
?

```
Set     Items   Description
S1          3   TRACKING (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR
```

```
             OR SUBSCRIBER) (W) (STORE OR SHOPPING )
S2           0   MONITORING  (W) MOVEMENT (W) (CUSTOMER OR CONSUMER OR PURC-
             HASER OR VISITOR OR SUBSCRIBER) (W) (STORE OR SHOPPING )
S3     6121674   MONITORING  (50) MOVEMENT (50) (CUSTOMER OR CONSUMER OR PU-
             RCHASER OR VISITOR OR SUBSCRIBER) (50) (STORE OR SHOPPING )
S4         237   MONITORING  (N50) MOVEMENT (N50) (CUSTOMER OR CONSUMER OR -
             PURCHASER OR VISITOR OR SUBSCRIBER) (50N) (STORE OR SHOPPING )
S5         118   S4 AND TRACK???
S6           0   (DELIVER??? OR TRANSPORT??? OR SEND??? OR BRING???) (W) (I-
             TEM? OR PRODUCT$1 OR GROCERIES OR GOODS) (W) (TERMINAL OR POS
             OR CHECKOUT OR CASHIER OR REGISTER)
S7           1   S5 AND (MOBILE (W) DEVICE)
?

T S5/3,K/1-30

  5/3,K/1     (Item 1 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2005  The Gale Group. All rts. reserv.

03415102  Supplier Number: 120351266    (USE FORMAT 7 OR 9 FOR FULLTEXT)
 Remote video auditing creates value.
 (Integrated Systems)
Security, v 41, n 8, p 32
August 2004
DOCUMENT TYPE: Journal  ISSN: 0890-8826  (United States)
LANGUAGE: English  RECORD TYPE: Fulltext
WORD COUNT:  811

    (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...providing visual documentation of events uncovered by the auditing
service. By utilizing RVA, companies can track events, breaches and
business practices at customer locations.

                                                ...
...by integrating with the security cameras at the cash  pay and pick-up
windows and monitoring  movement  .

Tony Delligatti, owner of three McDonald's franchises in North Carolina,
began using the  video...

...that annually costs the industry billions of dollars. Arrowsight worked
with Finish Line, a 500- store retail chain, at one of their target stores
in order to implement a system ensuring...

...four-month period.

Security however, is not the only area that companies are interested in
 monitoring  . RVA services also represent a cost-efficient method of culling
marketing research. In an effort to improve research and development and
increase sales, Pfizer retained Arrowsight to monitor the  customer
 movement  , behavior and overall viability of their in- store product
displays at a major drug store chain.

Christina Kerley is a marketing specialist based in New York City. Through
her consulting...
```

5/3,K/2 (Item 2 from file: 9)
DIALOG(R)File 9:Business & Industry(R)
(c) 2005 The Gale Group. All rts. reserv.

03239862 Supplier Number: 110507873 (USE FORMAT 7 OR 9 FOR FULLTEXT)
To change ... or not to change? Retailers ponder moving from random-weight to fixed-weight fresh meat.
(Packaging Technology)
National Provisioner, v 217, n 9, p 127
September 2003
DOCUMENT TYPE: Journal ISSN: 0027-996X (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1070

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...it's more difficult to have a random-weight product," Johnson says. "The auditing and **tracking** of a fixed-weight product is just so much easier to manage, and it's...

...Key Performance Indicators or KPIs," says Suderman. "We are (also) providing a fixed-weight scannable **customer** service score card, which identifies retail customers' business requirements so the supplier can manage his...
...critical. You live or die by that; it's the absolute bottom line."

Lack of **movement**

The reality is that some retailers, such as Penn Traffic--which operates 212 supermarkets under...

...to 'case ready,' which we have determined to be much less profitable than our current **store** -cut program," says Penn Traffic spokesman Marc Jampole. "We believe, however, that fixed weight is an interesting concept.

"It enables supermarket companies to learn more about **customer** buying practices by **tracking** sales by SKU on beef and pork products via IRI or Nielsen," he adds. "We will keep **monitoring** the growth and development of both fixed-weight and case-ready concepts."

Fixed-weight innovator...

...a knowledgebase was needed to maximize profitability, take advantage of early efforts at capturing Efficient **Consumer** Response (ECR) savings, and provide **consumer** preferred offerings for fresh chicken. It decided to fit ECR, a retail grocery business initiative...
...product. They can change price at the computer instead of the shelf. And because of **tracking** -efficiency improvements, there are fewer out-of-stocks.

Such systems can also allow automated switches...

5/3,K/3 (Item 3 from file: 9)
DIALOG(R)File 9:Business & Industry(R)
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02939195 Supplier Number: 96657280 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Making progress; Michelin moving forward on tire tag technology tests.

(News)
Tire Business, v 20, n 21, p 4
January 20, 2003
DOCUMENT TYPE: Journal ISSN: 0746-9070 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1192

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...Detroit. Technology provider sources earlier said Ford Motor Co. is leading the push for tire- **tracking** technology.

...

...tire circuit under the terms of the Automotive Industry Action Group's tire and wheel **tracking** standard, which was released last year. But competitive tire makers believe it may be the...

...technology directly on an automotive component. The tags will not only allow car makers to **track** tires and double-check incoming shipments for accuracy, but also to automate current vehicle identification...

...manager for tag maker Intermec. ''No other technology provides this type of visibility to the **consumer** level.''

Tire makers are looking at several approaches for mounting the tag to the tire...

...labels to meet the requirement to link a tire with a vehicle identification number for **tracking** purposes by November 2003. That was the overarching goal of a tire and wheel **tracking** standard released last March by the Automotive Industry Action Group. ''If there's ever a...

...RFID tags allow auto makers to automate the scanning or ''reading'' process, to ''write'' or **store** related data to them for in-plant use, and to install the necessary infrastructure-readers...
...Hoffman said. But the systems only transmit the VIN number and cannot be used to **store** data. Once a vehicle comes off the line and is separated from its carrier, there is no way to **track** it. The newer RFID technology will give car makers the opportunity to **track** the tires cradle to grave, check the accuracy of incoming tire shipments and identify the...

...and efficiencies gained from going from (two-dimensional) to RFID is sufficient to encourage that **movement** ,'' Mr. Hoffman said, without disclosing pricing for the new tire tags. ''They're significant.''

Goodyear...

...tire maker worked throughout the 1990s on technology to embed a tire-pressure and temperature- **monitoring** sensor into the tire.

''By 2005, I believe that Goodyear will be able to do the full job of tire pressure and temperature **monitoring** and identification,'' based on its collaboration with Siemens A.G.'s Siemens VDO Automotive unit...

...meet Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act requirements by building a tire-pressure **monitoring** function into the tire for a solution that's more cost effective, **consumer** friendly and less labor intensive, he said.

The transponder in Michelin's tires contains an...

5/3,K/4 (Item 4 from file: 9)
DIALOG(R)File 9:Business & Industry(R)
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02332976 Supplier Number: 25929439 (USE FORMAT 7 OR 9 FOR FULLTEXT)
CVS gears 'service-profit chain' to the customer
(CVS Corp, which operates 4,111 locations, has a number of strategies designed to maximize the possibilities of the "service-profit chain," which aims to provide maximum customer satisfaction through quality service from contented workers)
Chain Drug Review, v 22, n 21, p 44+
December 11, 2000
DOCUMENT TYPE: Journal ISSN: 0164-9914 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1282

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...ways to better support our managers," notes Merlo. "One of the biggest time factors for **store** managers is the whole ordering process. This streamlines that process significantly. We are now better able to **track** the **movement** of products on a weekly basis and to better forecast what that order should be...
...pay huge dividends in terms of providing an additional degree of accuracy while improving our **customer** service efforts."

Another technology initiative takes all point-of-sale scanning data and assists **store** managers in **monitoring** some aspects of□store□ performance.

"Everyone knows how much we've grown over the past three years and how...

5/3,K/5 (Item 5 from file: 9)
DIALOG(R)File 9:Business & Industry(R)
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01246882 Supplier Number: 23870129 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Price Chopper Chopping Out Out-of-Stocks, Stoking Sales
(Price Chopper Supermarkets reduces out-of-stock levels by 23% in participating stores)
Supermarket News, v 47, n 16, p 127+
April 21, 1997
DOCUMENT TYPE: Journal ISSN: 0039-5803 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 478

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...to an increase in sales.

"I am confident that our in-stocks are improving our **customer** -service level and our sales, and I am comfortable saying eliminating out-of-stocks was...

...has also experienced a 60% reduction in weekly rain checks since implementing the in-stock **monitoring** practice.
Ultimately, Golub told SN, he wants to achieve an out-of-stock level of...

...that chainwide but right now there are many variables, such as different product assortments and **movement** in each **store** , so it is tough to say if or when this can be a reality."

The...

...conducted its study in order to research how out-of-stocks affect Price Chopper's **customer** -service levels.

"The study identified and **tracked** , on a weekly basis, which items and categories were out of stock and why," said...

5/3,K/6 (Item 1 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02873756 811464681
It's a Tag, Tag, Tag, Tag World
Harris, Shane
Government Executive v37n4 PP: 17-18 Mar 15, 2005
ISSN: 0017-2626 JRNL CODE: GOV
WORD COUNT: 1015

...TEXT: people favor the jalapeno Monterey Jack? The radio tags will count every brick so the **store** manager can decide whether to buy more Jack. That means less money is wasted stocking...

...many bricks to make. In this world of inventory control, in which supplier, retailer and **consumer** are linked, every penny counts, and the tiny chips make it work smoothly.

This is...

...outfitted with RFID to improve logistics and supply chain management. NASA uses RFID tags to **track** the **movement** of hazardous chemicals. And the Food and Drug Administration issued guidelines last year for **monitoring** prescription medicines with RFID to combat counterfeiting. Total spending by federal agencies on RFID technology...

...research firm Input of Reston, Va.

So far, government's tagging has been limited to **tracking** inanimate objects. But by the end of this year, the State Department hopes to issue ...

...people through immigration lines at airports and border crossings much faster.

But the notion of **tracking** people-or even people's documents-has upset some civil liberties groups, and it's...

...and deducts the toll from the driver's account. That means the car can be **tracked** -a loss of privacy-but the consumer can choose whether to use the tag. He...

...prefer. There's little benefit to the consumer-the store uses the RFID tags to **track** inventory and save money. So, little choice, some privacy and little consumer benefit.
Paharia's...

5/3,K/7 (Item 2 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

02582825 326402441
Footfall: Making every customer count
Kitson, Jonathan
Management Services v47n4 PP: 18, 30 Apr 2003
ISSN: 0307-6768 JRNL CODE: MNS
WORD COUNT: 1421

ABSTRACT: It is a fact that many of the largest **shopping** malls in the UK are owned as investments by major pension funds because of the high and reliable return on investment they bring. **Shopping** malls, like any other major activity center in business, need to be properly measured and...

...traffic. The Birmingham, UK-based FootFall organization is the world leader in the business of **monitoring** pedestrian traffic flow. The name of the organization stems from the generic industry term for pedestrian **movement** into or past a retail outlet or **shopping** center - the footfall. FootFall's own equipment measures a staggering 2 billion people every year in **shopping** centers and retail outlets in 15 countries around the world. The **customer** relationship management system used by FootFall is discussed.
...TEXT: a particular day, a week, a month or a year.
Few people who like visiting **shopping** malls and enjoy the opportunity to buy everything they need under one roof, without the...

...any government agency; they are operated by FootFall, the world leader in retail pedestrian traffic **monitoring** systems.

The cameras do the traffic **monitoring** themselves; it isn't a question of simply recording video footage and manual operators counting...

...supermarket trolleys.

The Birmingham-based FootFall organisation is the world leader in the business of **monitoring** pedestrian traffic flow. The name of the organisation stems from the generic industry term for pedestrian **movement** into or past a retail outlet or **shopping** centre - the footfall.

FootFall's own equipment measures a staggering two billion people every year in **shopping** centres and retail outlets in 15 countries around the world. Organisations that use FootFall's systems include airports, museums, supermarkets, high street retailers and of course **shopping** centres. Within the UK, its clients include such well-known names as BHS, Boots, Heathrow Airport, Marks & Spencer as well as over 300 **shopping** centres across Europe.

FootFall Ltd, formed in 1991, originally confined itself to the supply of ...

...to information supplier has led to a need to provide a much higher level of **customer** service.

What does **customer** service mean for FootFall as an organisation? The answer is that, clearly, its entire rationale...

...the retail industry, FootFall tends to have hundreds of customers rather than millions, but each **customer** is particularly valuable to the organisation and must be precisely catered for in terms of...customers -- property managers, property developers and retailers - through telephone, fax, and email. Coordinating and keeping **track** of customer information was next to impossible. We desperately needed a CRM system that would...

5/3,K/8 (Item 3 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)
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02164529 71527633
Behind BlueEyes
Tristram, Claire
Technology Review v104n4 PP: 32 May 2001
ISSN: 1099-274X JRNL CODE: TCR
WORD COUNT: 329

TEXT: SOFTWARE I Most of us hardly notice the surveillance cameras watching over the grocery **store** or the bank. But lately those lenses have been looking for far more than shoplifters...

...report that a number of large retailers have implemented surveillance systems that record and interpret **customer** movements, using software from Almaden's BlueEyes research project. BlueEyes is developing ways for computers to anticipate users' wants by gathering video data on eye **movement** and facial expression. Your gaze might rest on a Web site heading, for example, and...

...register boredom or delight? How many reached for the item and put it in their **shopping** carts? BlueEyes works by **tracking** pupil, eyebrow and mouth **movement** . When **monitoring** pupils, the system uses a camera and two infrared light sources placed inside the product...

...camera-- aligned light, the pupil appears bright to the sensor, and the software registers the **customer** 's attention. BlueEyes has set off warning bells at the American Civil Liberties Union. "Soon...

5/3,K/9 (Item 4 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)
(c) 2005 ProQuest Info&Learning. All rts. reserv.

01742590 03-93580
All-in-one solutions
Uhlman, Ken
Buildings v92n12 PP: 22 Dec 1998
ISSN: 0007-3725 JRNL CODE: BLD
WORD COUNT: 687

...TEXT: HVAC, and the entire building, but also for gas, water, steam, and effluent); security; building **monitoring** (indoor air and power quality); and a number of other systems, such as **customer** counts, **movement** in a **store** , and point of sale.

The benefits of integrating building systems are significant, including lowering energy...

...Security systems can be linked into integrated systems. At the same time, customers can be **tracked** to determine where they go first, and the average amount spent. Using valuable information, stores...

5/3,K/10 (Item 5 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01735909 03-86899
Public transport: The role of mystery shopping in investment decisions
Wilson, Alan; Gutmann, Justin
Journal of the Market Research Society v40n4 PP: 285-293 Oct 1998
ISSN: 0025-3618 JRNL CODE: JRS
WORD COUNT: 3145

...TEXT: the existing Underground network. Of that approximately 225 million was spent on areas such as **track** , signalling, tunnels, bridges and power equipment aimed at addressing the first of the service attributes ...

...majority of users of such data are responsible for the operational management of stations and **tracks** . They use the mystery shopping scores for setting targets for staff and contractors as well...to 'spotlessly clean everywhere' only '/2p more.

(Table Omitted)

Captioned as: Table 3
Combining these **customer** values for service improvement with the number of passenger journeys made on line 'X' provides...

...testing using regression analysis to examine what if any relationship exists between changes in mystery **shopping** scores and changes in **customer** satisfaction.

Customer satisfaction is measured through 2,300 to 2,400 face-to-face interviews conducted every...

...and 10 is 'Extremely Satisfied'.

The regression analysis was undertaken to discover how great the **customer** satisfaction **movement** is for a one-point **movement** in the mystery **shopping** score. The results showed that every one point change in the overall average mystery **shopping** score resulted in an increase of 0.9 in the average **customer** satisfaction score. The relationship between scores on individual attributes existed although it was a weaker...

...main implication of this analysis is that there is statistical proof that changes in mystery **shopping** scores will feed through to changes in **customer** satisfaction. Therefore London Underground feels justified in using mystery **shopping** scores in their investment appraisal, in the knowledge that they reflect **customer** satisfaction, which is a major goal by which the business and the Department of Transport measures its success.

Conclusions

Mystery **shopping** , a research technique which is widely used for assessing and **monitoring** service delivery performance in service organisations is being used by London Underground in the development...

...other service organisations including banks, hotels and travel organisations. This would result in the important **customer** and service perspectives being placed at the centre of more investment decision-making processes. It...

5/3,K/11 (Item 6 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01542894 01-93882
Sampling without measurement is no sale
Ailloni-Charas, Dan
Brandweek v38n42 PP: 17 Nov 10, 1997
ISSN: 1064-4318 JRNL CODE: IADW
WORD COUNT: 635

TEXT: Does **consumer** sampling work?

Conceptually, allowing consumers to try out a new product, at no risk, can significantly accelerate the adoption of the new product, resulting in a quicker buildup of its **consumer** franchise. But, there's a caveat: should the trial exposure be a negative one, with...

...Measurement of sampling outcomes is therefore critical, whether it is done upfront or, alternatively, in **monitoring** the back-end results generated by a large-scale program.

Both forms of sampling are...

...levels, which are indicative of longer-term franchise gains. Of the two, though, the in- **store** measurement of sampling, in terms of its effect on purchasing behavior, is the more important...

...used instore, where the impact of a sampling program can be monitored in terms of **consumer** takeout through scanner data collected at checkout. **Movement** can be read for the item sampled before, during and after the actual sampling activity...

...the first place; that may require a large initial panel of consumers, more so if **tracking** is required over a longer period of time through multiple calls. Lastly, though, the survey...

5/3,K/12 (Item 7 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01253370 99-02766
Marketing in hypermedia computer-mediated environments: Conceptual foundations
Hoffman, Donna L; Novak, Thomas P
Journal of Marketing v60n3 PP: 50-68 Jul 1996
ISSN: 0022-2429 JRNL CODE: JMK
WORD COUNT: 13654

...TEXT: i.e., "person interactivity"). We further define network navigation as the process of self-directed **movement** through a hypermedia CME. This nonlinear search and retrieval process provides essentially unlimited freedom of choice and greater control for the **consumer** and may be contrasted with the restrictive navigation options available in traditional media such as...

...choice than the centrally controlled interactive multimedia systems, such as video-on-demand and home- **shopping** applications of so-called Interactive Television; the text-based French Minitel system (Cats-Baril and...

...based information-acceleration approach of Hauser, Urban, and Weinberg (1993); or the experimental systems for **monitoring** information processing, such as Mouselab (e.g., Payne, Bettman, and Johnson 1993).

Model 3: A...11 through 15), and variables related to the psychological experience of flow (e.g., lose **track** of time, selfawareness, concentration, mood, control). We anticipate that qualitative research (such as verbal protocol...

5/3,K/13 (Item 8 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01139523 97-88917
Sourcebook '96
Anonymous
Progressive Grocer Sourcebook '96 Supplement PP: Cover-48 Dec 1995
ISSN: 0033-0787 JRNL CODE: PGR
WORD COUNT: 18136

...TEXT: Mike Spindler, Exec. VP of Client Services

SPECIALIZATION: Only CPG information supplier that provides complete, **store** -by- **store** , all-item□movement□and causal data for forecasting & **monitoring** normal turn and promoted retail sales.

ADDITIONAL SERVICES: ECR-services based on ems "Operational Information" that include new item **tracking** , in- **store** promotion evaluation/testing, scan promotions & ECR partnership programs for DSD, CAO and manufacturer managed replenishment...

...complete, accurate, timely, consistent and actionable sales information on all items sold at each retail **store** every day.
Integrated Software 475 Park Avenue South New York, NY 10016-6901

PHONE:(212...

...most compelling, cost-effective solution available for automating the production of retail ads, circulars, in- **store** signage and catalogs.

By linking Merchandising and Advertising, Retail ADvantage(TM) leads to more effective merchandising strategies, Efficient **Customer** Response and improved Category Management. It ensures price maintenance for your circular, sign, and POS...decision support modules, statistical forecasting, allocation/load building, recommended PO review, integrated alternate sourcing, inbound **tracking** , receiving, cross docking, live dock, directed putaway, labor management, item **tracking** , warehouse/store

transfers, vendor invoice reconciliation, store invoicing/retail pricing, and ABC cost plus management...decision support modules, statistical forecasting, allocation/load building, recommended PO review, integrated alternate sourcing, inbound **tracking** , receiving, cross docking, live dock, directed putaway, labor management, item **tracking** , warehouse/store transfers, vendor invoice reconciliation, store invoicing/retail pricing, and ABC cost plus managementand order quantity. It provides usage **tracking** , replenishment scripts, exception processing, and reporting, and generates purchase requisitions from adjusted buy recommendations. FourGen...s only business and they set the standard in quality, versatility, and flexibility. Their NYLA- **TRACK** (R)II is sized for all major glass doors and beverage packaging. Their MILK MOOVER...DESCRIPTION: Off the Wall is a retail interior design and manufacturing firm with a proven **track** record in the supermarket industry. We are unique in that we design for some clients...

5/3,K/14 (Item 9 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00921621 95-71013
Retail distribution and logistics: The impact of information technologies
Anonymous
Chain Store Age Executive v69n5 (Section 2) PP: 1A-30A May 1993
ISSN: 0193-1199 JRNL CODE: CSA
WORD COUNT: 5908

...TEXT: application of information technologies to transportation, such as including open systems, advanced truck routing and **tracking** , is enlarging opportunities for retailers to work with third-party providers of transportation and distribution...

...application in the future.

With this caveat in mind, the emerging information technologies that merit **monitoring** are:

(see chart above.)

EMERGING INFORMATION TECHNOLOGIES
SUPPLY CHAINWIDE TECHNOLOGY--BENEFIT TO LOGISTICS MANAGERS

Open...

...Radio Frequency Tagging--allows information to be scanned and updated without having to interrupt the **movement** of goods.

Voice Recognition Technology--allows hands-free input of information by workers into computer...

...routes; allows deliveries to conform to increasingly precise delivery time windows to increase efficiency of **store** staffing.

Tracking Systems--allows **monitoring** of shipments progress throughout the delivery schedule; allows refinements in scheduling and early notification of arrival at the **store** .

STORE LEVEL TECHNOLOGY:

Electronic Manifest--allows paperless, automatic and rapid receipt of goods at the **store** .
Zone Coding--allows presorting of merchandise prior to **store** receipt which reduces work needed for stocking.

Flexible transportation and increasingly sophisticated information technology is...

...supply chain provides retailers with a competitive advantage over less efficient operators.

* Higher levels of **customer** satisfaction are being achieved through being in-stock on merchandise shoppers want in-stock.

* Timely...

...current distribution practices including cycle times of merchandise from vendor to store sales floor, merchandise **tracking** , quality measurement programs, and the use of push vs. pull methods of inventory control.

They...of a variety of information technologies in the distribution center including computer driven sorting and **tracking** , scanning for picking and put-away, and radio frequency communication with mobile terminals.
Outbound Transportation...

...based computing

* radio frequency tagging

* real-time EDI applications

* real-time replenishment forecasting

* satellite trailer **tracking**

* smart cards

* sophisticated decision support systems

* two dimensional barcodes

* voice recognition technology

* voice response technology...at 43%. Supermarkets and drug stores have the least coming from foreign vendors (8%).
Merchandise **Tracking** at sku Level: Nearly nine in 10 (87%) of the retailers report **tracking** merchandise at the sku level. Mass merchandisers and department stores are most likely (95%) to **track** at the sku level.

Specialty apparel retailers are most likely to report increases in their **tracking** at the sku level during the next 12 to 18 months (42%). Specialty apparel retailers are also most likely to report that they will initiate **tracking** at the sku level where none existed before.

Home centers/hardware stores are least likely to report increases in **tracking** at the sku level.

Merchandise **Tracking** in Distribution Operations at The Size and Color Level: Apparel intensive retailers, mass merchandisers/department store and

specialty apparel retailers, are most likely to report **tracking** at the size and color level. The largest planned increases in these practices are found...six types of information technologies in their distribution centers ranging from computer driven sorting and **tracking** to scanning for replenishment. Roughly three quarters (73%) are using at least one of the
...
...computerized truck routing, trailer cube planning software, advanced electronic manifest to store and in-route **tracking** .

Computerized Truck Routing: Computerized truck routing is perhaps the largest unexploited frontier in logistics management...

5/3,K/15 (Item 10 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00802797 94-52189
Info network promotes better manufacturer-retailer logistics
Schlossberg, Howard
Marketing News v28n1 PP: 26 Jan 3, 1994
ISSN: 0025-3790 JRNL CODE: MNW
WORD COUNT: 577

...TEXT: grocery stores, check prices, make merchandising and promotion more efficient, improve order processing, and better **track** new products?

And do it all overnight.

Catalina Information Resources (CIR), a joint venture between...

...quickest information turnaround systems for manufacturers and retailers. It's part of the ECR (efficient **consumer** response initiative in the packaged-goods industry to improve **customer** service and eliminate costs in the system for both manufacturers and retailers.

"We've been...
...shelves.

The IRI/Catalina venture helps get around problems like those by delivering overnight individual **store** data on product **movement** and promotional efficiency. The combined Catalina data and IRI massaging is designed to yield better **monitoring** of out-of-stocks while more carefully **tracking** real-time **consumer** demand for products, relative to promotion.

"Out-of-stocks show up that might have been...

...the IRI software applications that quickly clean the data overnight.

Time-aligning the data by **store** allows manufacturers and retailers to see what drove the volume **store** -to- **store** , he said.

For IRI, the CIR venture comes down to being an integral part of...

...like to turn on PCs."

The whole point is to "bring better value to the **consumer** ," Billings said, in the form of lower prices, better assortment, better product availability, and better...
...accept the program.

He believes the program is changing the mindset in the industry. Warehouse **tracking** was once the universally accepted way to measure product movement, but "the whole logistics world...

5/3,K/16 (Item 11 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00796602 94-45994
ESL: Up and running
Morton, Jerry
Progressive Grocer v72n12 (Part 3) PP: 23-24 Dec 1993
ISSN: 0033-0787 JRNL CODE: PGR
WORD COUNT: 1516

ABSTRACT: A notable trend in the supermarket industry is the **movement** of electronic shelf labels (ESL) from a stage of testing by a few pioneering retailers...

...by more mainstream supermarket users. To date, ESL technology has been tied to retail pricing, **customer** value-added services, category management, and efficient **consumer** response (ECR). Vendor orders indicate that by the 2nd quarter of 1994, there will be...

...times daily if necessary. Internal tests by another chain showed that ESLs installed in one **store** increased retail price accuracy to more than 99% from 94.7%. Full-function ESLs can be vital to the execution and **monitoring** of ECR space management strategies. The learning experiences of some current ESL users are shared.
...TEXT: tremendous discrepancies between the planogram and reality.

Some ESL systems are capable of doing location **tracking** . This capability is available from vendors that have designed their architecture and software to electronically...

5/3,K/17 (Item 12 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00783368 94-32760
Limits to interfirm coordination through information technology: Results of a field study in consumer packaged goods distribution
Clemons, Eric K; Row, Michael C
Journal of Management Information Systems: JMIS v10n1 PP: 73-95 Summer 1993
ISSN: 0742-1222 JRNL CODE: JMI
WORD COUNT: 10047

...TEXT: that all retailers interviewed had information systems in place to support investment buying and to **track** the economic returns from these activities.

The spikes in demand caused by promotions and exacerbated...to information on orders placed by retailers' distribution centers. They lack the information on product **movement** and inventory necessary to determine when products purchased by the retailer on promotion are, in fact, sold the **consumer** on promotion, sold later to the **consumer** at the regular retail

price, or sold to other retailers in nonpromoted regions. The **monitoring** problem faced by manufacturers is evidenced in a story told by one interview subject with...
...a truckload of diverted goods physically followed. Information flows that allow manufacturers to monitor product **movement** cheaply and reliably would enable pricing structures or contractual arrangements that would reduce or eliminate...

...then a single manufacturer's motivation for promoting would be higher.

Retailers promote to increase **store** sales; they are less concerned with which products make up those sales. A promotional price...were moving. UPC and checkout scanners at the store made it possible for retailers to **track** product movement themselves, first at the distribution center level, and then, as scanners became widely...

...improve coordination with all of their suppliers. Currently, their EDI network for pricing, purchasing, order **tracking** , and payment covers more than 2,000 vendors. Recently, Wal-Mart has rolled out a...

...pay for performance" arrangements, where payment to the retailer is tied to specific measurable criteria **tracked** through IT. The objective of such arrangements is to reduce behavior that creates channel inefficiencies...

5/3,K/18 (Item 13 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00662583 93-11804
Information technology and industrial cooperation: The changing economics of coordination and ownership
Clemons, Eric K; Row, Michael C
Journal of Management Information Systems: JMIS v9n2 PP: 9-28 Fall 1992
ISSN: 0742-1222 JRNL CODE: JMI
WORD COUNT: 9339

...TEXT: lacks the ability to measure quality at the front end and lacks the information to **track** future product failures back to the offending component, this opportunistic strategy will be successful. As...form more sophisticated incentives so that direct control is less necessary.

An example from the **consumer** packaged goods industry is instructive here.(10) Information technology, driven by the spread of checkout...

...given the history of conflict between retailers and manufacturers in this industry. Using IT for **monitoring** and for supporting new incentive structures is emerging as a critical issue in emerging cooperative arrangements.
Checkout scanners provide retailers with unprecedented amounts of timely, detailed information on product **movement** . Shelf-space management systems enable the retailer to harness this information to make more informed...

...manufacturers operate in a narrow range of categories, they can devote more resources to understanding **consumer** behavior and the market dynamics of their categories. This expertise, once developed, can be applied...

...this area. Increasingly, retailers are working cooperatively with manufacturers to determine shelf layouts. Manufacturers utilize **store** scanner data and information on specific market characteristics to suggest

changes to products and shelf...

...competing manufacturers. Once a layout has been implemented, they use scanner data to monitor product **movement** and analyze economic return on shelf space. Manufacturers thus have very little scope for exploiting...

...recommendations. In merchandising support, IT is both creating the opportunity for cooperation and providing the **monitoring** capability to reduce the transaction risk associated with cooperation.

3.1.3. LIMITATIONS OF IT...

5/3,K/19 (Item 14 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00645191 92-60131
LeoSat Panamericana: Latin American Communications on the Move
Villalvazo, Manuel
Satellite Communications v16n11 PP: 26 Nov 1992
ISSN: 0147-7439 JRNL CODE: SAC
WORD COUNT: 722

...ABSTRACT: 90 degrees. The communications system will provide remote and mobile messaging, paging, fax, electronic mail, **tracking** , security, and emergency and positioning services throughout Latin America via miniaturized user terminals and a...
...TEXT: operate a communications system to provide remote and mobile messaging, paging, fax, electronic mail, monitoring, **tracking** , security, emergency and positioning services throughout Latin America via miniaturized user terminals and a new...

...km diameter coverage area. The constellation will link two-way transmissions among mobile and fixed **subscriber** user terminals, two master control stations and several regional stations. The master and regional stations...

...Americans, will be provided with a family of low-cost, compact user terminals in 1995. **Monitoring** , **tracking** and location services will supply continuous or intermittent data for updates on highway conditions and the **movement** of hazardous and time-sensitive cargo, **tracking** of commercial and recreational ships, as well as the **monitoring** of wildlife. The paging service will provide rapid, secure, alphanumeric messages to and from pocket-sized terminals.

Security **monitoring** and recovery services also will be provided. The installation of simple radio beacon terminals will...

...Similarly, emergency services will be offered to users in need of immediate help constant medical **monitoring** .

Fax and electronic mail communications will be possible between users anywhere in the constellation coverage...

...computer or fax machine can be attached to the standard interface connection of the terminal. **Subscriber** terminals will transmit digitized packets of data to addresses via satellite.

Typical messages will take...

...minutes. For international message deliveries to the other side of the globe, the satellites will **store** the messages on-board until they pass over either the destination or a regional relay...

5/3,K/20 (Item 15 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

00095394 79-10405
Checkout Scanner Ultimately a Marketing Data Goldmine
Tauber, Edward
Marketing News v12n23 PP: 1, 11, 13 May 18, 1979
ISSN: 0025-3790 JRNL CODE: MNW

...ABSTRACT: by 1981. Up-front capital commitment is heavy as is the training expense for a **store** 's personnel. But the payout results from a **store** 's knowledge of its own inventory and the fact that stock that is depleted by **consumer movement** . It is for such reasons that scanners are considered the wave of the future. Three...

...marketing research as scanners become more common. Isolated experiments are already being conducted in controlled **store** testing, but this type of research is difficult to project to a broader geographical base. Projectable sales **monitoring** will emerge around the end of the 1980s. The third period entails the use of integrated systems of **consumer** and product **tracking** . The capability will offer measurements for **consumer** attitudes, psychographics, and family purchase behavior. Marketers who recognize the signs of this revolution in...

5/3,K/21 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

10920341 Supplier Number: 111702283 (USE FORMAT 7 FOR FULLTEXT)
REPEAT/Statement by Digital Angel Corp.
Business Wire, p5158
Dec 29, 2003
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 563

... that its proprietary, microchip meat safety systems are specifically designed to completely fulfill the livestock **tracking** and tracing needs necessary to minimize the human and animal health effects of "mad cow...

...national health advocates who have called for the immediate adoption of a comprehensive national cattle **tracking** and identification program.
Digital Angel's electronic technology, including patented FDA-approved RFID (Radio Frequency...

...food safety verification tool, the Digital Angel systems allow producers to automatically collect, report and **store** data on individual animals, personnel and husbandry practices. These systems help the producing and processing...

...only with safety issues, but also herd efficiency goals and the other

information demands of **consumer** -branded meat products.

About Digital Angel Corp.

Digital Angel Corporation develops and deploys sensor and communications technologies that enable rapid and accurate identification, location **tracking** , and condition **monitoring** of high-value mobile assets. Applications for the Company's products include identification and **monitoring** of pets, fish and livestock through its patented implantable microchips; location **tracking** and message **monitoring** of vehicles and aircraft in remote locations through systems that integrate GPS and geosynchronous satellite communications; and **monitoring** of asset conditions such as temperature and **movement** , through advanced miniature sensors.

Digital Angel Corporation is majority-owned by Applied Digital Solutions, Inc...

5/3,K/22 (Item 2 from file: 16)

10920315 Supplier Number: 111702257 (USE FORMAT 7 FOR FULLTEXT)

Statement by Digital Angel Corp.

Business Wire, p5115
Dec 29, 2003
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 560

... that its proprietary, microchip meat safety systems are specifically designed to completely fulfill the livestock **tracking** and tracing needs necessary to minimize the human and animal health effects of "mad cow...

...national health advocates who have called for the immediate adoption of a comprehensive national cattle **tracking** and identification program.

Digital Angel's electronic technology, including patented FDA-approved RFID (Radio Frequency...

...food safety verification tool, the Digital Angel systems allow producers to automatically collect, report and **store** data on individual animals, personnel and husbandry practices. These systems help the producing and processing...

...only with safety issues, but also herd efficiency goals and the other information demands of **consumer** -branded meat products.

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Digital Angel Corporation is majority-owned by Applied Digital Solutions, Inc...

5/3,K/23 (Item 3 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

10421550 Supplier Number: 93448379 (USE FORMAT 7 FOR FULLTEXT)
Managing produce shrink: the constantly changing landscape of the produce department can offer significant challenges for retailers to optimize shrink. (Focus on Fresh).
McLaughlin, Molly
Grocery Headquarters, v68, n10, p37(5)
Oct, 2002
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1795

... in the produce department (see chart).

In order to tackle these problems, data retrieval and **tracking** technologies can help produce managers collect, sort and incorporate applicable information to their shrink initiatives...in Stellarton, Nova Scotia. "We just wanted to put freshness in the hands of the **consumer** ."

To achieve optimal in- **store** freshness, McKnight began by revamping procurement processes for Sobeys stores in the Toronto, Ontario region to consumers. "It's changing the mindset from the **store** putting an order in of what they want to buy, to a **store** planning what they are going to sell."

MANAGING INVENTORY

According to NSRG, inefficient ordering accounts...

...consider demographic profiles for individual stores, assortment, promotional activity and rotation. Analyzing sales data and **monitoring** product displays can help produce managers predict **consumer** demand and adjust their orders and merchandising strategies.

"Inventory control is key," says Jan DeLyser...California Avocado Commission (CAC), based in Santa Ana, Calif "It's a matter of estimating **movement** --in other words, you want to keep the fruit moving through the system." For example, if a **store** pre-orders product for an advertised special, but does not meet projections, then that unit may need to run an in- **store** promotion to adjust for the increased supply.

Commodity boards such as CAC have evolved into...to carry one-third ripe, one-third breaking and one-third firm avocadoes to meet **consumer** demands as product rotates through the store. Depending upon a store's **consumer** base, these percentages may vary, says DeLyser.

THE COLD CHAIN ISN'T TOO COLD

After...HOW TO ACCURATELY MONITOR FRESHNESS LEVELS. RETEK, A MINNEAPOLIS-BASED SOFTWARE SOLUTIONS COMPANY, HELPS SUPERMARKETS **TRACK** PRODUCE SHRINK WITH A WEB-BASED MERCHANDISING APPLICATION THAT MANAGES PERPETUAL INVENTORY, PROFITS AND REPLENISHMENT...

5/3,K/24 (Item 4 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

10421548 Supplier Number: 93448377 (USE FORMAT 7 FOR FULLTEXT)
EPC and Auto-ID grow up: ePC and Auto-ID are helping retailers and suppliers move beyond UPCs and develop better methods of tracking **sales and inventory data. (Tech Solutions).**
Amato-McCoy, Deena M.
Grocery Headquarters, v68, n10, p29(3)
Oct, 2002

Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1504

...**Auto-ID are helping retailers and suppliers move beyond UPCs and develop better methods of** tracking **sales and inventory data. (Tech Solutions)**.
... night: replenishing the supply chain, reducing inventory and pinpointing recalls, says Phil Friedman, vice president **consumer** package goods for Redwood Shores, Calif.-based Oracle.

Out-of-stock concerns continue to haunt...System/VICS Collaborative Commerce convention in Chicago. "The third time a product is missing, the **customer** might not be as forgiving," he explained. Smart tags could be the future of replenishment...
...retailers with real-time data of when a product left or was added to a **store** shelf, taking collaborative planning, forecasting and replenishment (CPFR) methods to the next level.

"Traditional (CPFR...

...can change drastically with a new vision into exactly what product was bought in each **store** , at what time and price," says Oracle's Friedman of Auto-ID.

These ...fair amount of excess inventory, both in warehouses and back rooms, according to Friedman.

By **monitoring** product according to Auto-ID tag **movement** , grocers can return to a replenishment process similar to just-in-time deliveries. "This allocates more **store** square footage for selling and producing profit vs. using this space as inventory storage, which...based Sam's Club. "As tagged pallets of P&G paper towels arrive at the **store** 's loading dock, they are scanned by RFID readers," explained Randy Salley, vice president merchandising...RFID, while helping us to understand the physics of the technology."

The technology, which successfully **tracks** the movement of product through the supply chain, is now being tested on cases from...pallet from 2,000 retail locations and 34 manufacturer locations, says a company spokesman.

The " **track** and trace" test offers real-time visibility of assets as they flow through the supply chain. "The **tracking** capability will further enhance our ability to manage equipment pools and forms the basis for...volume. Retailers must find methods of storing individual item level data so items can be **tracked** throughout their life cycles. "Data needs to flow through systems enterprise-wide," says Miles ...tag by 2006. "As there starts to be high volume and more companies want to **track** product and equipment, tag prices need to drop," says Mike Strand rid, global technology adviser for Milwaukee-based Teklynx, a manufacturer and distributor of software for bar code printing and **tracking** .

RELATED ARTICLE: "MINORITY REPORT" TO SPUR RFID PREFERENCE **TRACKING** ?

When a clothing store scanned Tom Cruise's retina in "Minority Report," the technology recognized...adviser, Teklynx, a Milwaukee-based manufacturer and distributor of software for bar code printing and **tracking** . "The available bar codes and credit cards we carry today can enable this process now...

...marketing purposes."

Because the technology has the capability to enable customers to volunteer for RFID **tracking** of their product preferences, ultimately supermarket chains can enhance loyalty efforts, targeted marketing and better...

5/3,K/25 (Item 5 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

10254054 Supplier Number: 96657280 (USE FORMAT 7 FOR FULLTEXT)
Making progress; Michelin moving forward on tire tag technology tests.(News)
Tire Business, v20, n21, p4
Jan 20, 2003
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1311

... Detroit. Technology provider sources earlier said Ford Motor Co. is leading the push for tire- **tracking** technology.
The radio-frequency devices could help narrow the span of recalls by assigning a...

...tire circuit under the terms of the Automotive Industry Action Group's tire and wheel **tracking** standard, which was released last year. But competitive tire makers believe it may be the...

...technology directly on an automotive component. The tags will not only allow car makers to **track** tires and double-check incoming shipments for accuracy, but also to automate current vehicle identification...
...manager for tag maker Intermec. ``No other technology provides this type of visibility to the **consumer** level.''
Tire makers are looking at several approaches for mounting the tag to the tire...

...labels to meet the requirement to link a tire with a vehicle identification number for **tracking** purposes by November 2003. That was the overarching goal of a tire and wheel **tracking** standard released last March by the Automotive Industry Action Group. ``If there's ever a...

...RFID tags allow auto makers to automate the scanning or ``reading'' process, to ``write'' or **store** related data to them for in-plant use, and to install the necessary infrastructure-readers...

...Hoffman said. But the systems only transmit the VIN number and cannot be used to **store** data. Once a vehicle comes off the line and is separated from its carrier, there is no way to **track** it. The newer RFID technology will give car makers the opportunity to **track** the tires cradle to grave, check the accuracy of incoming tire shipments and identify the...

...and efficiencies gained from going from (two-dimensional) to RFID is sufficient to encourage that **movement** ,'' Mr. Hoffman said, without disclosing pricing for the new tire tags. ``They're significant.''
Goodyear...

...tire maker worked throughout the 1990s on technology to embed a tire-pressure and temperature- **monitoring** sensor into the tire.
``By 2005, I believe that Goodyear will be able to do the full job of tire pressure and temperature **monitoring** and identification,'' based on its collaboration with Siemens A.G.'s Siemens VDO Automotive unit...

...meet Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act requirements by building a tire-pressure **monitoring** function into the tire for a solution that's more cost effective, **consumer** friendly and less labor intensive, he said.

The transponder in Michelin's tires contains an...

5/3,K/26 (Item 6 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2005 The Gale Group. All rts. reserv.

09850642 Supplier Number: 86004091 (USE FORMAT 7 FOR FULLTEXT)
TransCore and Gatekeeper Systems Inc Strike Partnership, Uniting Leaders in Wireless, Automated Ground Transportation Management Systems.
Business Wire, p2001
May 19, 2002
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 952

... airport market a way to manage ground traffic while generating revenue streams and providing better **customer** service. The agreement leverages TransCore's hardware technologies and Gatekeeper's software development capabilities to...

...from one vendor and software from another. But now airports have an integrated, one-stop **shopping** solution at their disposal."
GTMS relies on RFID technology for automatic vehicle identification (AVI), linked...

...or particular sector of a facility. Gatekeeper's software systems use that data to enable **monitoring** , **tracking** , controlling, recording and reporting of commercial vehicle operations.
GTMS offers airport operators multiple benefits: increased...

...access on a "per use" basis versus the "honor" system; improved control of commercial vehicle **movement** ; more information on vehicle operator and company activity levels and passenger preferences; increased vehicle operator compliance with airport rules and regulations; better **customer** service to the traveling public; more efficient use of curbside space; reduced vehicle emissions; and...

5/3,K/27 (Item 7 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
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09247025 Supplier Number: 80495952 (USE FORMAT 7 FOR FULLTEXT)
For those willing to learn, the process will pay off: implementing this scientific product selection process that has become standard at retail requires companywide commitment. (Category Management).
Maras, Elliot
Automatic Merchandiser, v43, n10, p26(6)
Oct, 2001
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 4015

... enhances dual functions
Advances in both hardware and software have given vendors the ability to **track** individual product movement, which enables them to do two things: 1) account for drivers' actions...

...lead

It wasn't long before product suppliers took note of software companies' efforts to **track** line-item data. Suppliers naturally wanted product-level data for their own marketing purposes. Seeing...
...management also produces a savings through more efficient use of labor.

Key development: line-item **tracking**

Several operators further noted that because line-item accounting creates the ability to manage product...seminar last spring, Hale realized he was not making full use of his line item **tracking** capabilities. He decided it was time to stop letting the drivers choose the products.

The...Muzzio relies mostly on internal data for his product choices, but also looks at c- **store** data. "The c-stores are so far ahead of us as far as merchandising," he said.

As a Streamware **customer** , Muzzio is able to download line-item data from the handhelds and use it to...

...not inventoried, he said.

As machine and software technology advances, operators will be able to **track** product **movement** faster and more accurately. DEX handhelds and wireless **monitoring** systems will enhance category management in addition to the other management tasks they will simplify.

Many operators will have their first line-item **tracking** capability with DEX handhelds.

Main benefit: line item **tracking**

The main benefit of line-item **tracking** is accountability, according to John Sowell, president of North County Vending Inc., a 100-route...

...its customers after reviewing profitability reports.

Sowell's experience taught him that he cannot profitably **track** line item sales manually since it takes too much time. "Our benefits far exceed any...

5/3,K/28 (Item 8 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08471087 Supplier Number: 72467307 (USE FORMAT 7 FOR FULLTEXT)
Dreyer's to use viaLink program.
Ice Cream Reporter, v14, n4, p3
March 20, 2001
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 441

... select the entire suite of solutions and we expect to build additional traction in the **consumer** packaged goods and food industry as more customers realize that the viaLink Partner Package provides...

...trading."

The viaLink Partner Package builds on viaLink's foundational service, syncLink(SM), to provide **consumer** packaged goods manufacturers like Dreyer's the ability to synchronize item, price and promotion information, to have visibility to **store** level transactions, and to provide **monitoring** and control systems for scan-based trading with trading partners. The Partner Package consists of...

...the suite's services which include: clearLink(SM) - Lets all trading partners see the daily **movement** of products in and out of each **store** in near-real time; promoLink(SH) - Permits trading partners to promote

products at the point of sale and keep **track** of promotion dollars in near-real time; viaLink honor check-in - Enables trading partners to...

5/3,K/29 (Item 9 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
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08169328 Supplier Number: 68159028 (USE FORMAT 7 FOR FULLTEXT)
CVS gears 'service-profit chain' to the customer.(engaged, satisfied employees result in satisfied customers)(Company Profile)
Chain Drug Review, v22, n21, p44
Dec 11, 2000
Language: English Record Type: Fulltext
Article Type: Company Profile
Document Type: Magazine/Journal; Trade
Word Count: 1332

... ways to better support our managers," notes Merlo. "One of the biggest time factors for **store** managers is the whole ordering process. This streamlines that process significantly. We are now better able to **track** the **movement** of products on a weekly basis and to better forecast what that order should be...

...pay huge dividends in terms of providing an additional degree of accuracy while improving our **customer** service efforts."
Another technology initiative takes all point-of-sale scanning data and assists **store** managers in **monitoring** some aspects of□store□ performance.
"Everyone knows how much we've grown over the past three years and how...

5/3,K/30 (Item 10 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
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06854283 Supplier Number: 58071829 (USE FORMAT 7 FOR FULLTEXT)
ISS Ships SAFEsuite Decisions 2.1, Adds Support for Oracle8.
Business Wire, p0123
Dec 8, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 981

... greater challenge for security management. As an industry pioneer, ISS is pleased to continue our **track** record of innovation with a proven solution that addresses these challenges. With this latest version...

...component of SAFEsuite Decisions is a
scalable relational database that serves as a centralized data **store** for all enterprise security data. SAFEsuite Decisions utilizes both Microsoft(R) SQL Server(TM) 7.0 or Oracle8. -- Secure Data Collection -- The SAFElink component of SAFEsuite
Decisions enables the secure **movement** of cross-product security information including ISS SAFEsuite applications and third-party products deployed worldwide...
...S. suggested list price of $25,000 and is based upon the size of a **customer** 's protected network.
About ISS

ISS is a leading global provider of security management solutions for e business. By offering best-of-breed SAFEsuite security software, comprehensive ePatrol(TM) **monitoring** services and industry-leading expertise, ISS serves as its customers' trusted security provider protecting digital...
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T S5/9/9

5/9/9 (Item 4 from file: 15)
DIALOG(R)File 15:ABI/Inform(R)

01742590 03-93580
All-in-one solutions
Uhlman, Ken
Buildings v92n12 PP: 22 Dec 1998 ISSN: 0007-3725 JRNL CODE: BLD
DOC TYPE: Journal article LANGUAGE: English LENGTH: 1 Pages
WORD COUNT: 687
GEOGRAPHIC NAMES: US

DESCRIPTORS: Facilities management; Systems integration; Building automation
CLASSIFICATION CODES: 5100 (CN=Facilities management); 5240 (CN=Software & systems); 9190 (CN=United States); 9000 (CN=Short Article)

ABSTRACT: Traditionally, the design and operation of individual building systems - electrical; communications; lighting; heating, ventilating, and air-conditioning; and security - were independent processes. Advancements in hardware and software technology and a better understanding of the interrelationship between system functions have resulted in an exciting new concept: integrated system solutions.

TEXT: Headnote:
Integrated systems drive the future of building system design.

Traditionally, the design and operation of individual building systems --electrical; communications; lighting; heating, ventilating, and air-conditioning (HVAC); and security - were independent processes. Little thought was given to why or how the various functions in a building can be integrated to work together. Until now.

Advancements in hardware and software technology and a better understanding of the interrelationship between system functions have resulted in an exciting new concept that is driving the future of building system design: integrated system solutions. Integrated systems provide a wide range of benefits not only for building owners, but also for occupants.

The concept of integrated building systems involves coordinating, unifying, and tying together all of the electrical distribution, control, and communications functions in a facility. It's a solution that can benefit buildings of any size or complexity. Integrated systems can tie together the functions of any number of facilities. As a result, enterprise-wide interoperability is achieved, sometimes from a single control point.

Enterprise-wide integrated solutions monitor and control several functions: interior, exterior, and display lighting; HVAC; metering (not only of power for functions such as lighting, HVAC, and the entire building, but also for gas, water, steam, and effluent); security; building **monitoring** (indoor air and power quality); and a number of other systems, such as **customer**

counts, **movement** in a **store** , and point of sale.

The benefits of integrating building systems are significant, including lowering energy costs by reducing consumption and avoiding demand charges. An example of an integrated system is a building with lighting control that imperceptibly brightens or dims lighting by factoring in the amount of natural sunlight coming into a room. This control benefits the HVAC system by lightening the load, resulting in lower energy consumption and often demand charges. Often, this only requires a few simple sensors and controllers, which can save enough electricity to pay back the cost in a year.

With interoperability, it is entirely feasible to shed loads when rates are highest, or when demand is approaching its upper limit. This ability to shed and add loads will become increasingly important as prices for energy fluctuate more widely by time of day - a possible result of deregulation. This ability will also allow some facilities owners to negotiate uninterruptible rates. Other advantages of integrated systems include the ability to provide increased security and safety for facilities, as well as the people who occupy them. Higher levels of comfort and peace of mind for occupants mean less downtime. Another benefit is increased uptime for facilities. Integrated systems can be prewired to reduce wiring and other installation errors that often plague facilities owners and managers during commissioning and initial operations. Additionally, a more compact installation is possible in many cases. A two-section switchboard, equipped with remote-controlled breakers, can replace a large switchboard and a number of subpanels.

Consider chain stores, where integrated systems offer enterprise-wide interoperability. Often, building systems can be monitored from a single PC. From this PC, energy usage from each store can be monitored and compared, providing an opportunity to identify areas where costs can be reduced. Security systems can be linked into integrated systems. At the same time, customers can be **tracked** to determine where they go first, and the average amount spent. Using valuable information, stores configure space to move more product.

In a competitive society, and especially in the competitive environment established by a deregulated energy marketplace, interoperability of a facility's functions is critical for optimal profitability.
Sidebar:

Enterprise-wide integrated solutions Control interior, exterior, and display lighting.

Sidebar:

Control heating ventilating and air-onditioning (HVAC) systems. Meter power usage for lighting and HVAC systems, as well as gas, water, steam, and effluent.

Sidebar:

* Monitor security systems. Monitor building indoor air and power quality.

Oversee customer counts, movement within a store, and pointof-sale timing.
:e f

Sidebar:

if or More Information For more information on a variety of electrical and wiring products, circle or write in Inquiry No. 706 on the Free Product Information Card page 65.

Author Affiliation:

Ken Uhlman is manager of the retail facilities segment at Cutler-Hammer, Pittsburgh

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T S5/3,K/31-60

5/3,K/31 (Item 11 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06310050 Supplier Number: 54530903 (USE FORMAT 7 FOR FULLTEXT)
L.L. BEAN'S BALANCED VIEW.
Thilmany, Jean
WWD, p11(1)
April 28, 1999
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 601

... electronically from a centralized data repository.
L.L. Bean previously used many measuring systems to **track** customers and to learn a great deal about **customer** demographics. However, the retailer spent more time measuring and reacting to trends than it did...

...balanced-scorecard approach, the company strategy is first defined clearly, and then measurable factors are **tracked** in four areas: financials; **customer** satisfaction; business processes and learning and growth. The last area includes providing employee training and **monitoring** employee satisfaction, Kaplan said.
To successfully use this approach, L.L. Bean needed analysis software
...
...detailed data, such as daily sales of a specific T-shirt at a specific outlet **store** , D'Entremont said.
With its former analysis systems, L.L. Bean **tracked** about 160 different performance measures. Executives could then choose to change business practices from what they learned. These measures included **customer** profiles, sales specifics and inventory **movement** .
However, to streamline that **tracking** process and to measure fewer factors in much greater depth, L.L. Bean will now **track** only 12 business processes, all linked to the company's specific growth strategy.
The new software will allow L.L. Bean to **track** four key areas of information at this level of detail. In the future, this software...

5/3,K/32 (Item 12 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06105478 Supplier Number: 53682497 (USE FORMAT 7 FOR FULLTEXT)
TechBytes.
JE
Convenience Store News, v34, n1, p12(1)

Jan 11, 1999
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 341

... systems with Atlanta-based Radiant Systems Inc.'s point-of-sale device to help convenience **store** retailers **track** and control lottery tickets while increasing ticket sales. Interlott, based in Cincinnati, designs, manufactures, sells...

...financial services industries.
Among the benefits of the integration are total physical ticket security, increased **customer** throughput, detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting.
"This integration of Radiant Systems' Compu-Touch POS and Interlott's MVP...
...s Merchandise Management and Analysis (MM&A) program.
The Sales Analysis program helps individual stores **track** data on a daily basis, with comparisons to the prior year inventory. Analysis enables retailers...

5/3,K/33 (Item 13 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06091666 Supplier Number: 53630160 (USE FORMAT 7 FOR FULLTEXT)
2000 Online Merchants Help Launch the Internet's Largest Self-Regulatory Online Privacy Program.
PR Newswire, p0187
Jan 25, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 631

... view a Public Eye member's file to view the merchants privacy statement and privacy **track** record before executing a transaction.
"Our goal was to accelerate implementation of good privacy practices ...

...Public Eye. "Moreover, the program is truly self regulating. Though privacy statement creation, publishing and **monitoring** are facilitated by Public Eye, compliance, assessment and resolution are completely in the hands of...

...and their patrons. The key is the giant spot light created by Public Eye's **monitoring** and reporting system. It creates a compelling incentive for members to make sure that their...

...on the Internet but to serve as a catalyst to boost the fledgling privacy practices **movement** . Hopefully the Public Eye program will serve as a conduit to steer merchants toward more...

...end.
About Public Eye
Public Eye tests, certifies, and monitors Internet businesses for reliability and **customer** satisfaction. Launched in May of 1996 Public Eye has emerged as a leader in providing consumers and merchants with **consumer** confidence building services and products. The company is the organizer of the alliance of Certified Safe **shopping** sites. This network of registered

merchants have agreed to be monitored for reliability and **customer** satisfaction, and to openly display the record to online consumers. Public Eye's **monitoring** service allows Internet consumers to access useful reliability reports so they can check out these...

5/3,K/34 (Item 14 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2005 The Gale Group. All rts. reserv.

05887862 Supplier Number: 53079552 (USE FORMAT 7 FOR FULLTEXT)
Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems.
Business Wire, p1247
Oct 13, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 577

... Interlott MVP secure lottery ticket dispensing system. This prototype interface is designed to help C- **Store** retailers **track** and control lottery tickets while increasing ticket sales.
Eric Hinkle, Radiant Systems' President and Chief...

...first direct connectivity to a smart lottery ticket device; a milestone for the Petroleum & C- **store** industry."
The integration drives multiple benefits to C- **store** operators, including:
-- Total physical ticket security
-- Increased **customer** throughput (by moving lottery customers out of
the POS area to make ticket selections)
-- Detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting
-- Elimination of "cross-rings" and other ticket theft practices
-- Faster Shift changes...

5/3,K/35 (Item 15 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2005 The Gale Group. All rts. reserv.

05725385 Supplier Number: 50201249 (USE FORMAT 7 FOR FULLTEXT)
GAINING FROM LOSSES
BLAIR, ADAM
Supermarket News, v48, n29, p36
July 20, 1998
Language: English Record Type: Fulltext
Article Type: Article
Document Type: Magazine/Journal; Trade
Word Count: 1054

... have far broader applications, from increasing supply-chain efficiency to more effectively managing the in- **store** work force.
Retailers are discovering that point-of-sale **monitoring** software, a strong tool for dealing with theft by front-end employees, is most effective...

...by these systems not only identifies cashier shrink but also details lane-by-lane and **store** -by- **store** item□movement□ , building a valuable

data warehouse.
    In addition, radio frequency tags with the capability of having...
...move a product has made in its journey from the manufacturer's plant to the **consumer** 's home.
    Cashier software that monitors more than 40 transaction categories is being used by...

...provide an electronic audit trail of the life of the product. These things now are **tracked** using some manual and some automated systems, but the chip would be an integral part...a recall generally takes place after the product is sold at retail and consumed, so **tracking** that product in today's mode is virtually impossible.
    "But if the product were source tagged, it could be **tracked** all the way through [the supply chain]," Vehlhaber added. "You'd know the dates and ...

5/3,K/36 (Item 16 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2005 The Gale Group. All rts. reserv.

05721070 Supplier Number: 50195682 (USE FORMAT 7 FOR FULLTEXT)
Bad-Rep Reps
Longo, Tracey
Financial Planning, p158
July, 1998
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1918

... the other brokerage firms she works with stop a candidate dead in his or her **tracks** and send the application directly to the compliance department if any regulatory or credit problems...year. 'We cannot have the remedial benefits of our disciplinary actions thwarted by the simple **movement** of reps among firms.'
    Even if you set up phone banks for all of the...

...you want to hire, don't forget the new type of exams regulators have in **store** . Slowly but surely, the NASDR is roiling out risk-based exams that will allow the regulatory agency to concentrate its resources at firms with past problems, significant **customer** complaints or - you guessed it - bad brokers on its rolls. Better technology is allowing the...
...the more often it will be examined. At the same time, firms' own systems for **monitoring** bad brokers will become an open book to regulators. The NASDR is in the process...

5/3,K/37 (Item 17 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2005 The Gale Group. All rts. reserv.

04979812 Supplier Number: 47315559 (USE FORMAT 7 FOR FULLTEXT)
PRICE CHOPPER CHOPPING OUT OUT-OF-STOCKS, STOKING SALES
AMATO-McCOY, DEENA
Supermarket News, p127
April 21, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 491

... of Price Chopper's in-stock initiative followed a six-month study conducted in one **store** from April to October 1996. The first two stores went live following the study's...

...to an increase in sales.
"I am confident that our in-stocks are improving our **customer** -service level and our sales, and I am comfortable saying eliminating out-of-stocks was...

...has also experienced a 60% reduction in weekly rain checks since implementing the in-stock **monitoring** practice.
Ultimately, Golub told SN, he wants to achieve an out-of-stock level of...

...that chainwide but right now there are many variables, such as different product assortments and **movement** in each **store** , so it is tough to say if or when this can be a reality."
The...

...conducted its study in order to research how out- of-stocks affect Price Chopper's **customer** -service levels.
"The study identified and **tracked** , on a weekly basis, which items and categories were out of stock and why," said...

5/3,K/38 (Item 18 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03530747 Supplier Number: 44950262 (USE FORMAT 7 FOR FULLTEXT)
An Up And Coming Star
InformationWeek, p44
August 29, 1994
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Tabloid; General Trade
Word Count: 1097

... that repair goods for their own clients.
Airborne also has initiated what it calls 'proactive **monitoring** ' of **customer** packages. For several years, air couriers and their customers have been able to **track** the **movement** of a letter or package by keying an airbill number into an on-site PC...

...Airborne decided to take this a step further and build a system that alerts a **customer** service rep if a package doesn't arrive at its destination on time. Such information...

...shipped cans of films to individual venues.
Technicolor realized it would be more efficient to **store** films in warehouses near the airport hubs of one of the three large overnight air...

5/3,K/39 (Item 19 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

03301909 Supplier Number: 44559274 (USE FORMAT 7 FOR FULLTEXT)
Retailing's Dirty Little SECRET: Forward Buying and Diverting
Promo, v0, n0, p51
April, 1994

Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 2019

... building just-in-time delivery systems and eliminating waste in the manufacturer-to -retailer-to- **consumer** pipeline. The goal is to 'move product with more efficiency and velocity,' according to the...

...the pricing advantages of a forward-buy by economizing their replenishment logistics, from factory to **store** shelf.
In a test underway with the 160- **store** Giant food chain in the Washington, D.C. area, LogiCNet will try to help Giant get more efficient by **tracking** the amount of inventory in the pipeline, **monitoring** dreaded out-of-stock situations and measuring transportation and warehousing costs, among other key logistical...

...so far, but not yet actionable. Nevertheless, 'It's part of the need for a **movement** toward better productivity,' he says, in an environment of corporate downsizing.
And with ECR in...

5/3,K/40 (Item 20 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

02092861 Supplier Number: 42709778 (USE FORMAT 7 FOR FULLTEXT)
VeriFone Expands Market For Super Systems
Bank Technology News, p16
Feb, 1992
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 651

... retailers, including price look-up for 1,000 items, end-of-day readings, and the **monitoring** of **store** sales by period and the□movement□ of goods by department.
The Sapphire, in contrast, is currently available only with VeriFone's ...

...ECR application software that large retailers need for connecting into their various backroom systems and **tracking** inventory. Smaller retailers will find that the Diamond solution, which includes, for example, hot keys to keep **track** of a **store** 's top 20 departments, is comprehensive enough to handle their various inventory requirements.
Because VeriFone...
...Sapphire system, Diamond Retailer is the first retail Gemstone product to be delivered to a **customer** . The independent sales organization Cherry Payment Systems, based in Downers Grove, Ill., has taken delivery...

5/3,K/41 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

34197772 (USE FORMAT 7 OR 9 FOR FULLTEXT)
RSA Unveils RFID Tag Blocker
Antone Gonsalves, TechWeb News
CMPNETASIA.COM
February 25, 2004

JOURNAL CODE: WCMP LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 474

(USE FORMAT 7 OR 9 FOR FULLTEXT)

RSA Security Inc. on Tuesday unveiled blocking technology that would protect consumers from being **tracked** after buying products that contain radio frequency identification tags.

The technology, called RSA Blocker Tag...

RFID technology is being used in the retail industry to **track** inventory. The tags contain microprocessors that **store** product information useful in **monitoring** the **movement** of goods through a supply chain. The technology holds the potential of cutting costs by...

... primarily used on pallets and cases found in warehouses, they could someday be used on **store** shelves to **track** purchases.□Consumer□groups fear that **store** use of RFID tags could threaten the privacy of shoppers.

In a demonstration at the...

... checkout stand, but retailers have complained that the tag could be useful later if the **consumer** , for example, returns the product, or takes it back for repair or replacement under warranty...

...for market researcher Gartner Inc ., said.

"We need to get everyone together to make sure **consumer** privacy is protected and the needs of retailers are also considered," Woods said.

The blocking...

...across large retailers to address privacy concerns as they begin looking at item-level RFID **tracking** ," Michielsen said. "The question is when they'll look at item-level use. There's...

5/3,K/42 (Item 2 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

33035133 (USE FORMAT 7 OR 9 FOR FULLTEXT)
REPEAT/Statement by Digital Angel Corp.
BUSINESS WIRE
December 29, 2003
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 532

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... that its proprietary, microchip meat safety systems are specifically designed to completely fulfill the livestock **tracking** and tracing needs necessary to minimize the human and animal health effects of "mad cow...

... national health advocates who have called for the immediate adoption of a comprehensive national cattle **tracking** and identification program.

... food safety verification tool, the Digital Angel systems allow producers to automatically collect, report and **store** data on individual animals, personnel and husbandry practices. These systems help the producing and processing...

... only with safety issues, but also herd efficiency goals and the other information demands of **consumer** -branded meat products.

About Digital Angel Corp.

Digital Angel Corporation develops and deploys sensor and communications technologies that enable rapid and accurate identification, location **tracking** , and condition **monitoring** of high-value mobile assets. Applications for the Company's products include identification and **monitoring** of pets, fish and livestock through its patented implantable microchips; location **tracking** and message **monitoring** of vehicles and aircraft in remote locations through systems that integrate GPS and geosynchronous satellite communications; and **monitoring** of asset conditions such as temperature and **movement** , through advanced miniature sensors.

Digital Angel Corporation is majority-owned by Applied Digital Solutions, Inc...

5/3,K/43 (Item 3 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2005 Dialog. All rts. reserv.

33034643 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Statement by Digital Angel Corp.
BUSINESS WIRE
December 29, 2003
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 529

(USE FORMAT 7 OR 9 FOR FULLTEXT)

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... national health advocates who have called for the immediate adoption of a comprehensive national cattle **tracking** and identification program.

Digital Angel's electronic technology, including patented FDA-approved RFID (Radio Frequency...

... food safety verification tool, the Digital Angel systems allow producers to automatically collect, report and **store** data on individual animals, personnel and husbandry practices. These systems help the producing and processing...

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5/3,K/44 (Item 4 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

(c) 2005 Dialog. All rts. reserv.

32527345 (USE FORMAT 7 OR 9 FOR FULLTEXT)
ChoicePoint, Inc. at SunTrust Robinson Humphrey Business Services Conference - Part 1
FAIR DISCLOSURE WIRE
November 13, 2003
JOURNAL CODE: WFDW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 4884

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... for a contractor to go take a Home Depot product and install it in a **consumer** 's home. So we're trying to lead with one product and then spread to...

...your workforce if you are really concerned about managing risk? So there is an emerging **movement** to doing **monitoring** or alert services on certain classes of employees. For example, I hire somebody as ...to not only do pre-employment but also to do some form of post-employment **monitoring** or alert services.
It's going to take a while in many companies to get...
... consent to do a post-employment background check. In some cases, you know, a retail **store** , they probably have, you know, turnover at the clerk level of 100% a year. So...

... head count under management: How many people do we have on the payrolls of our **customer** base that are potentially going to be driving renewal or alert service products. So one of the things we began **tracking** was, you know, head count under management on our top 50 accounts and we went...

... numbers and what's going to happen from a management standpoint if we get off **track** . Last but not least, obviously we have to look at the financials of the deal...

5/3,K/45 (Item 5 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2005 Dialog. All rts. reserv.

08617164 (USE FORMAT 7 OR 9 FOR FULLTEXT)
ISS Ships SAFEsuite Decisions 2.1, Adds Support for Oracle8
BUSINESS WIRE
December 08, 1999
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 1147

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... greater challenge for security management. As an industry pioneer, ISS is pleased to continue our **track** record of innovation with a proven solution that addresses these challenges. With this latest version...

... component of SAFEsuite Decisions is a scalable relational database that serves as a centralized data **store** for all enterprise security data. SAFEsuite Decisions utilizes both Microsoft(R) SQL Server(TM) 7.0 or Oracle8. -- Secure Data Collection -- The SAFElink component of SAFEsuite Decisions enables the secure **movement** of cross-product security information including ISS SAFEsuite applications and third-party products deployed worldwide...

...S. suggested list price of $25,000 and is based upon the size of a **customer** 's protected network.

About ISS

ISS is a leading global provider of security management solutions for e business. By offering best-of-breed SAFEsuite security software, comprehensive ePatrol(TM) **monitoring** services and industry-leading expertise, ISS serves as its customers' trusted security provider protecting digital...

5/3,K/46 (Item 6 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

05184807 (USE FORMAT 7 OR 9 FOR FULLTEXT)
The End of Privacy: The surveillance society: New information technology offers huge benefits-higher productivity, better crime prevention, improved medical care, dazzling entertainment, more convenience. But it comes at a price: less and less privacy
ECONOMIST
May 01, 1999
JOURNAL CODE: FECN LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 2955

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... collect information that once went largely unrecorded, but are also making it relatively easy to **store** , analyse and retrieve this information in ways which, until quite recently, were impossible.

Just consider...

... who use discount cards. Mobile-phone companies are busy installing equipment that allows them to **track** the location of anyone who has a phone switched on. Electronic toll-booths and traffic- **monitoring** systems can record the **movement** of individual vehicles. Pioneered in Britain, closed-circuit TV cameras now scan increasingly large swathes of urban landscapes in other countries too. The trade in **consumer** information has hugely expanded in the past ten years. One single company, Acxiom Corporation in Conway, Arkansas, has a database combining public and **consumer** information that covers 95% of American households. Is there anyone left on the planet who...

... as companies to use data-processing technology. They do this for many entirely legitimate reasons- **tracking** benefit claimants, delivering better health care, fighting crime, pursuing terrorists. But it inevitably means more... without a crackdown so massive that it could stop the new information economy in its **tracks** .

Market solutions. The Americans generally prefer to rely on self-regulation and market pressures. Yet...

5/3,K/47 (Item 7 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

04116564 (USE FORMAT 7 OR 9 FOR FULLTEXT)
2000 Online Merchants Help Launch the Internet's Largest Self-Regulatory Online Privacy Program
PR NEWSWIRE
January 25, 1999

JOURNAL CODE: WPRW LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 635

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... view a Public Eye member's file to view the merchants privacy statement and privacy **track** record before executing a transaction.
"Our goal was to accelerate implementation of good privacy practices ...

... Public Eye. "Moreover, the program is truly self regulating. Though privacy statement creation, publishing and **monitoring** are facilitated by Public Eye, compliance, assessment and resolution are completely in the hands of...

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5/3,K/48 (Item 8 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

03093733
Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems
BUSINESS WIRE
October 13, 1998
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 599

... Interlott MVP secure lottery ticket dispensing system. This prototype interface is designed to help C- **Store** retailers **track** and control lottery tickets while increasing ticket sales. Eric Hinkle, Radiant Systems' President and Chief...

... first direct connectivity to a smart lottery ticket device; a milestone for the Petroleum & C- **store** industry." The integration drives multiple benefits to C- **store** operators, including: -- Total physical ticket security -- Increased **customer** throughput (by moving lottery customers out of the POS area to make ticket selections) -- Detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting -- Elimination of "cross-rings" and other ticket theft practices -- Faster Shift changes...

5/3,K/49 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

16557856 SUPPLIER NUMBER: 111702283 (USE FORMAT 7 OR 9 FOR FULL TEXT
)
REPEAT/Statement by Digital Angel Corp.
Business Wire, 5158
Dec 29, 2003
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 563 LINE COUNT: 00053

... that its proprietary, microchip meat safety systems are specifically designed to completely fulfill the livestock **tracking** and tracing needs necessary to minimize the human and animal health effects of "mad cow...

...national health advocates who have called for the immediate adoption of a comprehensive national cattle **tracking** and identification program.
Digital Angel's electronic technology, including patented FDA-approved RFID (Radio Frequency...

...food safety verification tool, the Digital Angel systems allow producers to automatically collect, report and **store** data on individual animals, personnel and husbandry practices. These systems help the producing and processing...

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Digital Angel Corporation is majority-owned by Applied Digital Solutions, Inc...

5/3,K/50 (Item 2 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

16557830 SUPPLIER NUMBER: 111702257 (USE FORMAT 7 OR 9 FOR FULL TEXT
)
Statement by Digital Angel Corp.
Business Wire, 5115
Dec 29, 2003
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 560 LINE COUNT: 00052

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tracing needs necessary to minimize the human and animal health effects of "mad cow...

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5/3,K/51 (Item 3 from file: 148)

DIALOG(R)File 148:Gale Group Trade & Industry DB

15562031 SUPPLIER NUMBER: 98372047 (USE FORMAT 7 OR 9 FOR FULL TEXT)

Internet in the Air: Internet Librarian 2002. (Internet Express).

McDermott, Irene E.
Searcher, 11, 3, 10(4)
March, 2003
ISSN: 1070-4795 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 2663 LINE COUNT: 00213

... by machine.

Computers are learning to watch video, too, and to analyze the patterns of **movement** that are detected. As the Carnegie-Mellon University, the "Video Surveillance and Activity **Monitoring** (VSAM)" Web site says:

Mounting video cameras is cheap, but finding available human resources to 24-hour **monitoring** of surveillance video to alert security officers to a burglary in progress, or to a...

...cs.cmu.edu/~vsam/).

Other applications of video surveillance technologies include measuring traffic flow, compiling **consumer** demographics in **shopping** malls and amusement parks, logging routine maintenance tasks at nuclear facilities, and counting endangered species...idea that one must pay for information." With the state of digital rights today, every **customer** is potentially a crook. In the next decade, Powers predicts, standards for paying for Web...new, these ladies love it. Among the gadgets they reviewed were GPS-enhanced watches for **tracking** children and Alzheimer's patients,

a device that transforms a tabletop into a speaker, a...

5/3,K/52 (Item 4 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

15119157 SUPPLIER NUMBER: 93448379 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Managing produce shrink: the constantly changing landscape of the produce department can offer significant challenges for retailers to optimize shrink. (Focus on Fresh).
McLaughlin, Molly
Grocery Headquarters, 68, 10, 37(5)
Oct, 2002
ISSN: 1094-1088 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1795 LINE COUNT: 00154

... in the produce department (see chart).

In order to tackle these problems, data retrieval and **tracking** technologies can help produce managers collect, sort and incorporate applicable information to their shrink initiatives...in Stellarton, Nova Scotia. "We just wanted to put freshness in the hands of the **consumer** ."

To achieve optimal in- **store** freshness, McKnight began by revamping procurement processes for Sobeys stores in the Toronto, Ontario region to consumers. "It's changing the mindset from the **store** putting an order in of what they want to buy, to a **store** planning what they are going to sell."

MANAGING INVENTORY

According to NSRG, inefficient ordering accounts...

...consider demographic profiles for individual stores, assortment, promotional activity and rotation. Analyzing sales data and **monitoring** product displays can help produce managers predict **consumer** demand and adjust their orders and merchandising strategies.

"Inventory control is key," says Jan DeLyser...California Avocado Commission (CAC), based in Santa Ana, Calif "It's a matter of estimating **movement** --in other words, you want to keep the fruit moving through the system." For example, if a **store** pre-orders product for an advertised special, but does not meet projections, then that unit may need to run an in- **store** promotion to adjust for the increased supply.

Commodity boards such as CAC have evolved into...to carry one-third ripe, one-third breaking and one-third firm avocadoes to meet **consumer** demands as product rotates through the store. Depending upon a store's **consumer** base, these percentages may vary, says DeLyser.

THE COLD CHAIN ISN'T TOO COLD

After...HOW TO ACCURATELY MONITOR FRESHNESS LEVELS. RETEK, A MINNEAPOLIS-BASED SOFTWARE SOLUTIONS COMPANY, HELPS SUPERMARKETS **TRACK** PRODUCE SHRINK WITH A WEB-BASED MERCHANDISING APPLICATION THAT MANAGES PERPETUAL INVENTORY, PROFITS AND REPLENISHMENT...

5/3,K/53 (Item 5 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

15119155 SUPPLIER NUMBER: 93448377 (USE FORMAT 7 OR 9 FOR FULL TEXT)
EPC and Auto-ID grow up: ePC and Auto-ID are helping retailers and suppliers move beyond UPCs and develop better methods of tracking **sales and inventory data. (Tech Solutions).**
Amato-McCoy, Deena M.

Grocery Headquarters, 68, 10, 29(3)
Oct, 2002
ISSN: 1094-1088 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1504 LINE COUNT: 00123

...**Auto-ID are helping retailers and suppliers move beyond UPCs and develop better methods of** tracking **sales and inventory data. (Tech Solutions)**.
... night: replenishing the supply chain, reducing inventory and pinpointing recalls, says Phil Friedman, vice president **consumer** package goods for Redwood Shores, Calif.-based Oracle.

Out-of-stock concerns continue to haunt...System/VICS Collaborative Commerce convention in Chicago. "The third time a product is missing, the **customer** might not be as forgiving," he explained. Smart tags could be the future of replenishment...

...retailers with real-time data of when a product left or was added to a **store** shelf, taking collaborative planning, forecasting and replenishment (CPFR) methods to the next level.

"Traditional (CPFR...

...can change drastically with a new vision into exactly what product was bought in each **store** , at what time and price," says Oracle's Friedman of Auto-ID.

These ...fair amount of excess inventory, both in warehouses and back rooms, according to Friedman.

By **monitoring** product according to Auto-ID tag **movement** , grocers can return to a replenishment process similar to just-in-time deliveries. "This allocates more **store** square footage for selling and producing profit vs. using this space as inventory storage, which...based Sam's Club. "As tagged pallets of P&G paper towels arrive at the **store** 's loading dock, they are scanned by RFID readers," explained Randy Salley, vice president merchandising...RFID, while helping us to understand the physics of the technology."

The technology, which successfully **tracks** the movement of product through the supply chain, is now being tested on cases from...pallet from 2,000 retail locations and 34 manufacturer locations, says a company spokesman.

The " **track** and trace" test offers real-time visibility of assets as they flow through the supply chain. "The **tracking** capability will further enhance our ability to manage equipment pools and forms the basis for...volume. Retailers must find methods of storing individual item level data so items can be **tracked** throughout their life cycles. "Data needs to flow through systems enterprise-wide," says Miles ...tag by 2006. "As there starts to be high volume and more companies want to **track** product and equipment, tag prices need to drop," says Mike Strand rid, global technology adviser for Milwaukee-based Teklynx, a manufacturer and distributor of software for bar code printing and **tracking** .

RELATED ARTICLE: "MINORITY REPORT" TO SPUR RFID PREFERENCE **TRACKING** ?

When a clothing store scanned Tom Cruise's retina in "Minority Report," the technology recognized...adviser, Teklynx, a Milwaukee-based manufacturer and distributor of software for bar code printing and **tracking** . "The available bar codes and credit cards we carry today can enable this process now...

...marketing purposes."

Because the technology has the capability to enable customers to volunteer for RFID **tracking** of their product preferences, ultimately supermarket chains can enhance loyalty efforts, targeted marketing and better...

5/3,K/54 (Item 6 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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14654152 SUPPLIER NUMBER: 86004091 (USE FORMAT 7 OR 9 FOR FULL TEXT)
TransCore and Gatekeeper Systems Inc Strike Partnership, Uniting Leaders in Wireless, Automated Ground Transportation Management Systems.
Business Wire, 2001
May 19, 2002
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 952 LINE COUNT: 00086

... airport market a way to manage ground traffic while generating revenue streams and providing better **customer** service. The agreement leverages TransCore's hardware technologies and Gatekeeper's software development capabilities to...from one vendor and software from another. But now airports have an integrated, one-stop **shopping** solution at ...or particular sector of a facility. Gatekeeper's software systems use that data to enable **monitoring** , **tracking** , controlling, recording and reporting of commercial vehicle operations.

GTMS offers airport operators multiple benefits: increased vehicle **movement** ; more information on vehicle operator and company activity levels and passenger preferences; increased vehicle operator compliance with airport rules and regulations; better **customer** service to the traveling public; more efficient use of curbside space; reduced vehicle emissions; and...

5/3,K/55 (Item 7 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

13376086 SUPPLIER NUMBER: 73958995 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Behind BlueEyes.(Technology Information)
Tristram, Claire
Technology Review (Cambridge, Mass.), 104, 4, 32
May, 2001
ISSN: 1099-274X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 347 LINE COUNT: 00030

... report that a number of large retailers have implemented surveillance systems that record and interpret **customer** movements, using software from Almaden's BlueEyes research project. BlueEyes is developing ways for computers to anticipate users' wants by gathering video data on eye **movement** and facial expression. Your gaze might rest on a Web site heading, for example, and...

...register boredom or delight? How many reached for the item and put it in their **shopping** carts? BlueEyes works by **tracking** pupil, eyebrow and mouth **movement** . When **monitoring** pupils, the system uses a camera and two infrared light sources placed inside the product...

...camera-aligned light, the pupil appears bright to the sensor, and the software registers the **customer** 's attention.

BlueEyes has set off warning bells at the American Civil Liberties Union. "Soon...

5/3,K/56 (Item 8 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

12921650 SUPPLIER NUMBER: 68159028 (USE FORMAT 7 OR 9 FOR FULL TEXT)
CVS gears 'service-profit chain' to the customer.(engaged, satisfied employees result in satisfied customers)(Company Profile)
Chain Drug Review, 22, 21, 44
Dec 11, 2000
DOCUMENT TYPE: Company Profile ISSN: 0164-9914 LANGUAGE: English
RECORD TYPE: Fulltext
WORD COUNT: 1332 LINE COUNT: 00106

... ways to better support our managers," notes Merlo. "One of the biggest time factors for **store** managers is the whole ordering process. This streamlines that process significantly. We are now better able to **track** the **movement** of products on a weekly basis and to better forecast what that order should be...

...pay huge dividends in terms of providing an additional degree of accuracy while improving our **customer** service efforts."
Another technology initiative takes all point-of-sale scanning data and assists **store** managers in **monitoring** some aspects of□store□ performance.
"Everyone knows how much we've grown over the past three years and how...

5/3,K/57 (Item 9 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

11556832 SUPPLIER NUMBER: 58071829 (USE FORMAT 7 OR 9 FOR FULL TEXT)
ISS Ships SAFEsuite Decisions 2.1, Adds Support for Oracle8.
Business Wire, 0123
Dec 8, 1999
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1032 LINE COUNT: 00100

... greater challenge for security management. As an industry pioneer, ISS is pleased to continue our **track** record of innovation with a proven solution that addresses these challenges. With this latest version...

...component of SAFEsuite Decisions is a
scalable relational database that serves as a centralized data **store** for all enterprise security data. SAFEsuite Decisions utilizes both Microsoft(R) SQL Server(TM) 7.0 or Oracle8. -- Secure Data Collection -- The SAFElink component of SAFEsuite
Decisions enables the secure **movement** of cross-product security information including ISS SAFEsuite applications and third-party products deployed worldwide...

...S. suggested list price of $25,000 and is based upon the size of a **customer** 's protected network.
About ISS
ISS is a leading global provider of security management solutions for e business. By offering best-of-breed SAFEsuite security software, comprehensive ePatrol(TM) **monitoring** services and industry-leading expertise, ISS serves as its customers' trusted security provider protecting digital...

5/3,K/58 (Item 10 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

11022167 SUPPLIER NUMBER: 54530903 (USE FORMAT 7 OR 9 FOR FULL TEXT)
L.L. BEAN'S BALANCED VIEW.
Thilmany, Jean
WWD, 11(1)
April 28, 1999
ISSN: 0149-5380 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 639 LINE COUNT: 00058

... electronically from a centralized data repository.
L.L. Bean previously used many measuring systems to **track** customers and to learn a great deal about **customer** demographics. However, the retailer spent more time measuring and reacting to trends than it did...

...balanced-scorecard approach, the company strategy is first defined clearly, and then measurable factors are **tracked** in four areas: financials; **customer** satisfaction; business processes and learning and growth. The last area includes providing employee training and **monitoring** employee satisfaction, Kaplan said.
To successfully use this approach, L.L. Bean needed analysis software ...
...detailed data, such as daily sales of a specific T-shirt at a specific outlet **store** , D'Entremont said.
With its former analysis systems, L.L. Bean **tracked** about 160 different performance measures. Executives could then choose to change business practices from what they learned. These measures included **customer** profiles, sales specifics and inventory **movement** .
However, to streamline that **tracking** process and to measure fewer factors in much greater depth, L.L. Bean will now **track** only 12 business processes, all linked to the company's specific growth strategy.
The new software will allow L.L. Bean to **track** four key areas of information at this level of detail. In the future, this software...

5/3,K/59 (Item 11 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10806601 SUPPLIER NUMBER: 53702086 (USE FORMAT 7 OR 9 FOR FULL TEXT)
FROM SHOPPING CARTS TO KIOSKS TO THE POS, RETAILERS ARE BUILDING SPECIFIC RELATIONSHIPS WITH SPECIFIC CUSTOMERS.
CORBIN, COLE
Supermarket News, 18(1)
Dec 14, 1998
ISSN: 0039-5803 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1181 LINE COUNT: 00097

... customers through the use of an electronic device mounted on a shopping cart. The unit **tracks** where the customer is in the store, and features audio product announcements and discounts.
Retailers...

...past behavior."
The kiosk system is electronically connected to the retailer's POS system. The **customer** has 24 hours to receive the discount on any selected

items, and all discounts are...

...can also pose problems. Besides taking up precious floor space or not functioning during peak **shopping** times, kiosks are sometimes viewed as an additional stop for time-starved customers, and intriguing to curious, rather than serious, users.

"Let's say a **customer** needs to stop by the **store** after work to buy dinner, however they want to get home," Spelts said. "What happens...

...line (at the kiosk) or some adolescents are playing with it while their mother is **shopping** ? Is that **customer** going to wait?"

These hurdles have generally been the bane of operating a perfect kiosk system within the stores, Spelts said.

Kiosks are not the only in- **store** media tool using the power of retailer databases. Some retailers are **monitoring** item **movement** at the POS in relation to specific promotions to provide offers for free samples and...

...incentives.

These offers are generated in the form of paper coupons, and delivered through in- **store** printing machines at the POS.

The coupon-printing machine is triggered when specific items featured ...

...free samples at the POS. Customers can redeem the coupon within two weeks at the **store** where the coupon was issued.

"It encourages the **consumer** to return to the retailer where they got (the receipt for the free sample)," said...

...coupons have a 34% redemption rate at the stores offering the promotions.

Another version of **customer** -specific coupons printed at checkout are multiple-purchase incentives. These coupons entitle consumers to a...

...shopping trip.

Retailers also combine this marketing tool with themes based on store demographics, specific **consumer** needs and different holidays and events. Sheboygan, Wis.-based Schultz Sav-O Stores' 86 Piggly...

...gaining attention is a device mounted over a rear wheel of a shopping cart that **tracks** customers through the store. The device triggers an audio advertisement when the customer enters a...

5/3,K/60 (Item 12 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10767891 SUPPLIER NUMBER: 53630160 (USE FORMAT 7 OR 9 FOR FULL TEXT)
2000 Online Merchants Help Launch the Internet's Largest Self-Regulatory Online Privacy Program.
PR Newswire, 0187
Jan 25, 1999
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 666 LINE COUNT: 00059

... view a Public Eye member's file to view the merchants privacy statement and privacy **track** record before executing a transaction.

"Our goal was to accelerate implementation of good privacy practices ...

...Public Eye. "Moreover, the program is truly self regulating. Though privacy statement creation, publishing and **monitoring** are facilitated by Public Eye, compliance, assessment and resolution are completely in the hands of...

...and their patrons. The key is the giant spot light created by Public Eye's **monitoring** and reporting system. It creates a compelling incentive for members to make sure that their...
...on the Internet but to serve as a catalyst to boost the fledgling privacy practices **movement** . Hopefully the Public Eye program will serve as a conduit to steer merchants toward more...

...end.
About Public Eye
Public Eye tests, certifies, and monitors Internet businesses for reliability and **customer** satisfaction. Launched in May of 1996 Public Eye has emerged as a leader in providing consumers and merchants with **consumer** confidence building services and products. The company is the organizer of the alliance of Certified Safe **shopping** sites. This network of registered merchants have agreed to be monitored for reliability and **customer** satisfaction, and to openly display the record to online consumers. Public Eye's **monitoring** service allows Internet consumers to access useful reliability reports so they can check out these...
?

T S5/3,K/61-90

5/3,K/61 (Item 13 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

10733949 SUPPLIER NUMBER: 53535704 (USE FORMAT 7 OR 9 FOR FULL TEXT)
All-in-one solutions.(integrated building system design)
Uhlman, Ken
Buildings, 92, 12, 22(1)
Dec, 1998
ISSN: 0007-3725 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 729 LINE COUNT: 00065

... HVAC, and the entire building, but also for gas, water, steam, and effluent); security;, building **monitoring** (indoor air and power quality); and a number of other systems, such as **customer** counts, **movement** in a **store** , and point of sale.
The benefits of integrating building systems are significant, including lowering energy...

...Security systems can be linked into integrated systems. At the same time, customers can be **tracked** to determine where they go first, and the average amount spent. Using valuable information, stores...

5/3,K/62 (Item 14 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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10684346 SUPPLIER NUMBER: 53368609 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Public transport: the role of mystery shopping in investment decisions.
Wilson, alan; Gutmann, Justin
Journal of the Market Research Society, 40, 4, 285(9)

Oct, 1998
ISSN: 0025-3618 LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 3463 LINE COUNT: 00320

... existing Underground network. Of that approximately (pounds)225 million was spent on areas such as **track** , signalling, tunnels, bridges and power equipment aimed at addressing the first of the service attributes ...majority of users of such data are responsible for the operational management of stations and **tracks** . They use the mystery shopping scores for setting targets for staff and contractors as well...39 24 7

Total system 1,686 1,418 1,150 842

Reliability of mystery **shopping** scores

If investment decisions are to be partially based on the mystery **shopping** survey scores, it is essential that the scores provide a reliable and reasonably accurate measure...
...testing using regression analysis to examine what if any relationship exists between changes in mystery **shopping** scores and changes in customer satisfaction.

Customer satisfaction is measured through 2,300 to 2,400 face-to-face interviews conducted every...

...and 10 is 'Extremely Satisfied'.

The regression analysis was undertaken to discover how great the **customer** satisfaction **movement** is for a one-point□movement□in the mystery **shopping** score. The results showed that every one point change in the overall average mystery **shopping** score resulted in an increase of 0.9 in the average **customer** satisfaction score. The relationship between scores on individual attributes existed although it was a weaker...

...main implication of this analysis is that there is statistical proof that changes in mystery **shopping** scores will feed through to changes in **customer** satisfaction. Therefore London Underground feels justified in using mystery **shopping** scores in their investment appraisal, in the knowledge that they reflect **customer** satisfaction, which is a major goal by which the business and the Department of Transport measures its success.

Conclusions

Mystery **shopping** , a research technique which is widely used for assessing and **monitoring** service delivery performance in service organisations is being used by London Underground in the development...

...other service organisations including banks, hotels and travel organisations. This would result in the important **customer** and service perspectives being placed at the centre of more investment decision-making processes. It...

5/3,K/63 (Item 15 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10523546 SUPPLIER NUMBER: 53079552 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems.
Business Wire, 1247
Oct 13, 1998
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 634 LINE COUNT: 00062

... Interlott MVP secure lottery ticket dispensing system. This

prototype interface is designed to help C- **Store** retailers **track** and control lottery tickets while increasing ticket sales.
Eric Hinkle, Radiant Systems' President and Chief...

...first direct connectivity to a smart lottery ticket device; a milestone for the Petroleum & C- **store** industry."
The integration drives multiple benefits to C- **store** operators, including:
-- Total physical ticket security
-- Increased **customer** throughput (by moving lottery customers out of
the POS area to make ticket selections)
-- Detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting
-- Elimination of "cross-rings" and other ticket theft practices
-- Faster Shift changes...

5/3,K/64 (Item 16 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10461373 SUPPLIER NUMBER: 21081274 (USE FORMAT 7 OR 9 FOR FULL TEXT)
GAINING FROM LOSSES.(loss prevention technology for supermarkets)
Blair, Adam
Supermarket News, v48, n29, p36(1)
July 20, 1998
ISSN: 0039-5803 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1130 LINE COUNT: 00094

... have far broader applications, from increasing supply-chain efficiency to more effectively managing the in- **store** work force.
Retailers are discovering that point-of-sale **monitoring** software, a strong tool for dealing with theft by front-end employees, is most effective...

...by these systems not only identifies cashier shrink but also details lane-by-lane and **store** -by- **store** item□movement□ , building a valuable data warehouse.
In addition, radio frequency tags with the capability of having...

...move a product has made in its journey from the manufacturer's plant to the **consumer** 's home.
Cashier software that monitors more than 40 transaction categories is being used by...

...provide an electronic audit trail of the life of the product. These things now are **tracked** using some manual and some automated systems, but the chip would be an integral part...a recall generally takes place after the product is sold at retail and consumed, so **tracking** that product in today's mode is virtually impossible.
"But if the product were source tagged, it could be **tracked** all the way through (the supply chain)," Vehlhaber added. "You'd know the dates and ...

5/3,K/65 (Item 17 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

09644574 SUPPLIER NUMBER: 16992431 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Building quality into the web printing process. (part 1)
Thome, John D.
Paper, Film & Foil Converter, v69, n5, p140(5)
May, 1995
ISSN: 0031-1138 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 3634 LINE COUNT: 00286

... running web in real time, but also to send corrective signals to the press and **track** the corrective action at full press speed.
A basic system consists of an electronic charge...the information in a high-volume memory bank on a computer board called a frame **store** . The digitized data is then transmitted to an SVGA color or monochrome monitor, allowing you...

...make or break the productive value of any system is its software. It controls every **movement** and function of the system as well as the quality of the data-digitization process. Software also drives the high-end features that require massive processing power, such as color **monitoring** , defect detection and bar-code **monitoring** .
Some systems have their software permanently burned into one or more computer processing chips, called...

...the lower priced systems on the market today don't do this, but rather employ **consumer** -grade personal-computer chassis, electronics and hard drive to **store** and manipulate the data. Using even the newer 90 to 100 megahertz Pentium and other...

...systems are inherently limited in their capacity to perform memory-eating functions such as color **monitoring** , bar code **monitoring** or any form of defect detection.
The monitor is the final ingredient in any system...Management software serves to help you manage the printing process. Typically, this program will keep **track** of jobs run, how many impressions were run, the length of the run, the average...

5/3,K/66 (Item 18 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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09497106 SUPPLIER NUMBER: 19334283 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Price Chopper chopping out out-of-stocks, stoking sales.(supermarket chains' new inventory management program)
Amato-McCoy, Deena
Supermarket News, v47, n16, p129(2)
April 21, 1997
ISSN: 0039-5803 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 556 LINE COUNT: 00045

... Price Chopper's in-stock initiative fol- lowed a six-month study conducted in one **store** from April to October 1996. The first two stores went live following the study's...

...to an increase in sales.
"I am confident that our in-stocks are improving our **customer** -service level and our sales, and I am comfortable saying eliminating out-of-stocks was...

...has also experienced a 60% reduction in weekly rain checks since

implementing the in-stock **monitoring** practice.
Ultimately, Golub told SN, he wants to achieve an out-of-stock level of...

...that chainwide but right now there are many variables, such as different product assortments and **movement** in each **store** , so it is tough to say if or when this can be a reality."
The...

...conducted its study in order to research how out-of-stocks affect Price Chopper's **customer** -service levels.
"The study identified and **tracked** , on a weekly basis, which items and categories were out of stock and why," said...

5/3,K/67 (Item 19 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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07261948 SUPPLIER NUMBER: 15429569 (USE FORMAT 7 OR 9 FOR FULL TEXT)
NHMA POS program for all members. (National Houseware Manufacturer's Association, point-of-sale data-gathering program)
Paul, Cynthia A.
HFD-The Weekly Home Furnishings Newspaper, v68, n19, p44(1)
May 9, 1994
ISSN: 0746-7885 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 645 LINE COUNT: 00051

...ABSTRACT: completed testing. InfoScan data is collected from retail scanners and helps vendors understand product movement, **track** competitors' sales and assess the impact of promotions. All NHMA members can buy into the...
... updated sales data and share information."
Specifically, the program will allow manufacturers to determine monthly **movement** of products; compare **movement** to competitors' **movement** ; **track** how product□movement□corresponds to different in-**store** promotions; create factual presentations based on product performance; and make informed decisions on pricing, merchandising, item selection, space utilization, promotional productivity, competitive **monitoring** and response.
Although not included in the NHMA contract, IRI can make available regional product- **movement** reports, according to IRI's Karen Dominique.
A handful of companies had committed to the...

...Decker, based in Shelton, Conn., was one of the first to commit, said director of **consumer** development Carol Dores. "We feel we are the leader in small appliances, and having the...

5/3,K/68 (Item 20 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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07202191 SUPPLIER NUMBER: 15202398 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Sour marketers need to take a fresh look. (convenience stores need to check on product expiration dates) (C-Store Opportunities)
Sloan, Ralph E.
National Petroleum News, v86, n2, p28(1)
Feb, 1994
ISSN: 0149-5267 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT

WORD COUNT: 950 LINE COUNT: 00072

...ABSTRACT: can have detrimental effects on customers. As such, stores should carry monitoring systems which help **track** product movement. The installation of shelf tags with built-to levels on them also helps...
... negative impression one step further, shoppers who find out-of-date grocery goods in one **store** may make the reasonable assumption that other stores in the chain will offer similar, substandard goods. This negative perception can quickly undo much of the positive work by C- **store** chains to earn their reputation for consistent quality.
With some food items, the risks associated...

...become stale, and once infestation occurs in a few items, it can spread throughout the **store** , ruining the entire inventory.
This costly, unpleasant scenario can be avoided or eliminated with a ...

...and freshness.
A good first step is to review all the products listed in planograms. **Movement** statistics from local grocery wholesalers should be reviewed, and the quantities that are ordered should closely reflect buying patterns and **customer** preferences for individual markets. Products that are past their prime should be removed from the...

...food, all of which are code dated. This system will accommodate broad variations in the **movement** of top sellers versus others that don't move as quickly, but which C-stores are expected to have their assortment.
These types of **monitoring** systems are helpful in **tracking** product **movement** , and they are part of the service your grocery wholesaler should offer. If the supplier...

...program to restore high standards for food freshness and quality must include accountability. In one **store** , all the milk in one particular container size was out of date. The **store** manager showed little concern. His attitude was that the out-of-date milk wasn't...

...wrong. It was his problem because he was conveying a very negative message to his **customer** , one that could easily be applied to every other **store** in the chain.
Taking this process one step further, regional supervisors must ensure that individual...

5/3,K/69 (Item 21 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06223014 SUPPLIER NUMBER: 14349285 (USE FORMAT 7 OR 9 FOR FULL TEXT)
A Quick Response success story. (K Mart Corp.'s Quick Response Program.)(includes related article)
Cooke, James Aaron
Traffic Management, v31, n10, p54(3)
Oct, 1992
ISSN: 0041-0691 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT; ABSTRACT
WORD COUNT: 2059 LINE COUNT: 00164

... level. Moreover, with Quick Response, the stores have the item on the shelf when a **customer** wants it. "When you and I go to buy something, it's less likely to...

...to Success
1) Institute daily deliveries to all stores.
2) Provide 48-hour turnaround of **store** orders.
3) Reduce inventory at distribution centers and stores.
4) Exercise more control over vendor...

...carriers.
7) Establish specific time periods for individual deliveries.
8) Set up a vendor/carrier **monitoring** program.
Distribution's Role in Implementing QR
Although Kmart's distribution department handles the physical **movement** of the goods being replenished via Quick Response, the company's information systems group has...

...advances. These technologies allow the retailer and its suppliers to share information to keep the **store** shelves full of the merchandise requested by the **customer** .
David M. Carlson, Kmart's senior vice president for information systems, refers to these advances...

...Kmart's distribution centers in packages carrying the familiar black-and-white striped symbols. When **store** clerks scan individual items at the checkout counter, sales data is captured and relayed to...

...Shipping container coding and marking. Codes provide the retailer with a means of identifying and **tracking** the cartons of merchandise flowing through the distribution network. Although vendors are only starting to...

5/3,K/70 (Item 22 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

06203117 SUPPLIER NUMBER: 13619179 (USE FORMAT 7 OR 9 FOR FULL TEXT)
LeoSat Panamericana: Latin American communications on the move. (Emerging Regions: Latin America)
Villalvazo, Manuel
Satellite Communications, v16, n11, p26(1)
Nov, 1992
ISSN: 0147-7439 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 792 LINE COUNT: 00066

TEXT:
...operate a communications system to provide remote and mobile messaging, paging, fax, electronic mail, monitoring, **tracking** , security, emergency and positioning services throughout Latin America via miniaturized user terminals and a new...
... km diameter coverage area. The constellation will link two-way transmissions among mobile and fixed **subscriber** user terminals, two master control stations and several regional stations. The master and regional stations...

...Americans, will be provided with a family of low-cost, compact user terminals in 1995. **Monitoring** , **tracking** and location services will supply continuous or intermittent data for updates on highway conditions and the **movement** of hazardous and time-sensitive cargo, **tracking** of commercial and recreational ships, as well as the **monitoring** of wildlife. The paging service will provide rapid, secure, alphanumeric messages to and from pocket-sized terminals.
Security **monitoring** and recovery services also will be provided. The

installation of simple radio beacon terminals will...

...emergency services will be offered to users in need of immediate help or constant medical **monitoring** .
Fax and electronic mail communications will be possible between users anywhere in the constellation coverage...

...computer or fax machine can be attached to the standard interface connectors of the terminal. **Subscriber** terminals will transmit digitized packets of data to addresses via satellite.
Typical messages will take...

...minutes. For international message deliveries to the other side of the globe, the satellites will **store** the messages on-board until they pass over either the destination or a regional relay...

5/3,K/71 (Item 23 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05891831 SUPPLIER NUMBER: 12295775 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Supersegmentation: partnering for profits. (retailers share demographic data from scanners with manufacturers for marketing purposes; see related article on developing the niche product)
Morris, Charles E.
Food Engineering, v64, n5, p107(8)
May, 1992
ISSN: 0193-323X LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 3216 LINE COUNT: 00271

... manufacturers is one of his functions. Meanwhile, a marketing strategist develops competitive strategy and target- **customer** mix for each **store** , creating an operating profile used by the merchandiser to develop the **store** 's tactical plans. He analyses profit potential for each market and defines objectives using market demographics, **consumer** and purchase history, and information about competitors as well as his own knowledge and experience.
At this point, SMART **STORE** shifts to the Supply side of the equation. The supply manager at chain headquarters aims at delivering products selected by the merchandiser to the individual **store** at least-possible cost by coordinating direct replenishment, based on POS data, via an EDI...

...of individual performance plans and deals; procure merchandise with an eye to sourcing options, terms, **movement** projections and stock status; plan and monitor the manufacturer's performance and service levels.
Retailer...

...and shelving of existing product lines. Goal: Work with the retailer to boost profitable product **movement** at the individual **store** .
Now that the chain merchandiser has more impact on **store** content, manufacturer sales representatives can customize services to individual stores, including **monitoring** stock conditions, recording shelf-allocation and competitive information, removing spoils and outdates, realigning shelf sets and building displays. Key tool: the electronic notepad.
A **consumer** -marketing group develops strategies for categories or brand portfolios to influence consumers to "pull" products...

...brand-management and marketing mixes; evaluates efficiency and impact of

advertising and promotion strategies on **consumer** purchase behavior; examines sales and profit implications of trade promotions; develops products and programs for...
...workbench, he can look ahead at future sales, distribution and production plans; anticipate and resolve **customer** -service issues; monitor daily operations and review performance; optimize operations based on true costs; optimize...

...forecasts from account management and consumer marketing, to schedule production. The plant-manager's workbench **tracks** labor, materials, production and maintenance, allowing him to improve manufacturing flexibility by reducing set-up...

5/3,K/72 (Item 24 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

05161612 SUPPLIER NUMBER: 10450344 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Inventory control and planning for a new season. (coffee industry)
Friedman, Susan
Tea & Coffee Trade Journal, v163, n1, p68(1)
Jan, 1991
ISSN: 0040-0343 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 694 LINE COUNT: 00055

... everything from initial feasibility checklists and stocking for a month or a season to purchasing, **monitoring** of inventory **movement** , and more.
When you first opened your **store** , your inventory control system should have had at least two goals:
* Prevent an excessive amount...

...merchandise.
* Maintain a balanced assortment of merchandise to meet customers' needs.
Now think about your **store** (s) today. Did you meet those goals then? Are you presently meeting them?
According to Irving Burstiner in Run Your Own **Store** , "Maintaining effective control over stock is important in all kinds and sizes of retail operations...

...one. At best, the owner-manager flirts with loss when stock becomes unbalanced."
For your **store** to be successful, you must stock the merchandise your customers want when they want to...

...help you determine what to buy when:
* Fill out a "want slip" each time a **customer** asks for an item you don't carry.
* Read the trade magazines you subscribe to...

...items that are heavily advertised.
* Talk with your suppliers. Let them fill you in on **consumer** and product trends across the country.
* Comparison shop. Study your competitors. When attending a trade...

...promotions, and the elimination of items that no longer move--you're on the right **track** .
Your shelf space is precious and must be planned carefully for your

retail store to...

5/3,K/73 (Item 25 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

04511474 SUPPLIER NUMBER: 08346743 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Videos get message out. (videos as selling tools in supermarkets)
Friedrick, Joanne
Grocery Marketing, v56, n1, p23(2)
Jan, 1990
ISSN: 0888-0360 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 745 LINE COUNT: 00059

... programs also varies, Noveau said, noting some chains will spend $1,000 or more per **store** to equip it, while others will get equipment on loan from manufacturers that supply them...

...boards, are more widely accepted, the survey showed. Noveau explained generics "look like a pure **consumer** service," while branded videos, supplied by manufacturers, were often seen as a form of advertising...

...hard numbers are used to measure the effectiveness of POP video. The report added "informal **monitoring** of case **movement** and□customer□ response is the most frequent means of **tracking** ."
Noveau said, however, BTV has done some test programs with retailers in which sales before...

5/3,K/74 (Item 26 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

03522575 SUPPLIER NUMBER: 06447668 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Global air freight success requires end to 'mistrust.' (editorial)
Eddy, Art
Transportation & Distribution, v29, n6, p2(1)
June, 1988
DOCUMENT TYPE: editorial ISSN: 0895-8548 LANGUAGE: ENGLISH
RECORD TYPE: FULLTEXT
WORD COUNT: 532 LINE COUNT: 00046

... was Edward J. Wilkinson, president of Terminal Freight Handling Co. in Illinois. With his major **customer** Sears Roebuck & Co., Wilkinson recognized the importance of supportive cost containment to clients. Service and...

...with JIT inventory management, "smaller, more frequent shipments will be a future trend... Therefore, electronic **tracking** will become essential" to achieve:
* inventory reduction and rapid replenishments
* fail-safe methods of distribution through comprehensive **monitoring** .

"Air cargo services can meet that challenge," said Wilkinson, "if they incorporate the concept of one-stop **shopping** . Air freight **movement** , therefore, must automatically be intermodal."

5/3,K/75 (Item 27 from file: 148)

DIALOG(R)File 148:Gale Group Trade & Industry DB
(c)2005 The Gale Group. All rts. reserv.

03522191 SUPPLIER NUMBER: 06381384 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Scanner data potential seen largely untapped. (in supermarkets)
Zimmerman, Susan
Supermarket News, v38, n20, p1(5)
May 16, 1988
ISSN: 0039-5803 LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
WORD COUNT: 1804 LINE COUNT: 00150

... produces strong returns relative to costs.
. Shelf management systems which develop planograms based on item **movement** , case packs and product dimensions. Purchase price would be about $165,000 for the 50- **store** chain, plus installation price of $150,000 and ongoing labor costs of $120,000 a year. Payback would be less than a year.
. Localized marketing, customizing a **store** 's merchandising mix based on area demographics. Development cost would be affected by other systems in place, such as DPP or shelf management. Primary implementation challenge is training and **monitoring** **store** management. This application could be used easily by independents, the study says, but could be...

...if DPP and shelf management are in place; additional cost might be $35,000 per **store** , and ongoing costs would be $100,000 a year for the 50- **store** chain. This can be very productive if other merchandising applications precede it, the study says...

...strong focus on changing the mix of promotional items and repricing some items to exploit **consumer** cross-buying behavior, the study says.
. Computer-assisted ordering, in which item movement, on-hand inventory, shipping schedules and lead time are key elements. This system uses scan data to **track** item movement and compute perpetual inventory. This is the first of what Blattberg termed the...

...year would see payback within a year.
. Direct marketing, which uses customer ID cards to **track** each shopper's purchases and offer tailored promotions for that shopper's needs. Developing this...

5/3,K/76 (Item 1 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2005 The Gale Group. All rts. reserv.

02686530 SUPPLIER NUMBER: 98372047 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Internet in the Air: Internet Librarian 2002. (Internet Express).
McDermott, Irene E.
Searcher, 11, 3, 10(4)
March, 2003
ISSN: 1070-4795 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 2663 LINE COUNT: 00213

... by machine.
Computers are learning to watch video, too, and to analyze the patterns of **movement** that are detected. As the Carnegie-Mellon University, the "Video Surveillance and Activity **Monitoring** (VSAM)" Web site says:
Mounting video cameras is cheap, but finding available human resources to 24-hour **monitoring** of surveillance video to alert security officers to a burglary in progress, or to a...

...cs.cmu.edu/~vsam/).
Other applications of video surveillance technologies include measuring traffic flow, compiling **consumer** demographics in **shopping** malls and amusement parks, logging routine maintenance tasks at nuclear facilities, and counting endangered species...idea that one must pay for information." With the state of digital rights today, every **customer** is potentially a crook. In the next decade, Powers predicts, standards for paying for Web...new, these ladies love it. Among the gadgets they reviewed were GPS-enhanced watches for **tracking** children and Alzheimer's patients, a device that transforms a tabletop into a speaker, a...

5/3,K/77 (Item 2 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2005 The Gale Group. All rts. reserv.

02499900 SUPPLIER NUMBER: 73958995 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Behind BlueEyes.(Technology Information)
Tristram, Claire
Technology Review (Cambridge, Mass.), 104, 4, 32
May, 2001
ISSN: 1099-274X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 347 LINE COUNT: 00030

... report that a number of large retailers have implemented surveillance systems that record and interpret **customer** movements, using software from Almaden's BlueEyes research project. BlueEyes is developing ways for computers to anticipate users' wants by gathering video data on eye **movement** and facial expression. Your gaze might rest on a Web site heading, for example, and...

...register boredom or delight? How many reached for the item and put it in their **shopping** carts? BlueEyes works by **tracking** pupil, eyebrow and mouth **movement** . When **monitoring** pupils, the system uses a camera and two infrared light sources placed inside the product...

...camera-aligned light, the pupil appears bright to the sensor, and the software registers the **customer** 's attention.
BlueEyes has set off warning bells at the American Civil Liberties Union. "Soon...

5/3,K/78 (Item 3 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)
(c) 2005 The Gale Group. All rts. reserv.

02364517 SUPPLIER NUMBER: 58835630 (USE FORMAT 7 OR 9 FOR FULL TEXT)
AlphaBlox.(Analytical Solutions, AlphaBlox create AlphaBlox Analysis Suite)(Product Information)
Intelligent Enterprise, 3, 1, R6
Jan 1, 2000
LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1148 LINE COUNT: 00100

... since 1968 and is the largest electrical distributor in the mid-Atlantic region. Driven by **customer** service, the company measures its success not only in terms of revenue and margins, but also on **customer** satisfaction and loyalty. That's why Branch chose to implement E*TELLIGENCE.

Margins are key...

...to make sure that products are always in stock for their best customers.
Using the **customer** profitability and analysis portion of E*TELLIGENCE, Branch was able to identify who its most profitable customers are across the company and at each individual **store** . Branch can now identify key cost factors by vendor, such as orders completed on the...
...component in E*TELLIGENCE helps Branch see sales trends and make inventory adjustments at the **store** while **monitoring** inter-company inventory **movement** . All these factors contribute to overall increases in margin at Branch.
Identifying the least-profitable...

...of Branch's E*TELLIGENCE implementation has been a tremendous net gain in margin. Increased **customer** loyalty has raised the potential for increased margins in the form of cross-selling, lower price sensitivity, new **customer** referrals, and lower costs of administration. Inventory carrying costs and marketing costs will continue to decrease, while sellthrough will continue to increase, with all dynamics being **tracked** at Branch.
A less-quantifiable but equally significant benefit of the new system is increased...

5/3,K/79 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01163447
Method and apparatus for determining if user walks away from a self-service checkout terminal during operation thereof
Verfahren und Vorrichtung zum Feststellen ob ein Selbstbedienungsabrechnungsterminal wahrend seines Betriebes von einem Kunden verlassen wird
Methode et dispositif pour determiner si un utilisateur quitte un terminal d'enregistrement de supermarche en self-service pendant l'operation de celui-ci
PATENT ASSIGNEE:
NCR INTERNATIONAL INC., (1449480), 1700 South Patterson Boulevard, Dayton, Ohio 45479, (US), (Applicant designated States: all)
INVENTOR:
Morrison, James, 6055 Masters Club Drive, Suwanee, Georgia 30024, (US)
LEGAL REPRESENTATIVE:
Williamson, Brian et al (84717), NCR Limited International Patent Department 206 Marylebone Road, London NW1 6LY, (GB)
PATENT (CC, No, Kind, Date): EP 1014319 A2 000628 (Basic)
APPLICATION (CC, No, Date): EP 99310288 991221;
PRIORITY (CC, No, Date): US 217542 981221
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: G07G-001/00; A47F-009/04; G07C-011/00
ABSTRACT WORD COUNT: 113
NOTE:
Figure number on first page: 3

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:
Available Text Language Update Word Count
CLAIMS A (English) 200026 948

SPEC A (English) 200026 5385
Total word count - document A 6333
Total word count - document B 0
Total word count - documents A + B 6333

...SPECIFICATION counter 42 which is located proximate the bagwell 38. It should be appreciated that a **customer** may place an item onto the portion of the counter 42 proximate the bagwell 38...

...item, but prior to placing the item into a grocery bag. For example, if a **customer** scans a loaf of bread, the **customer** may want to place the bread onto the portion of the counter 42 proximate the...

...out of the bagwell 38 along with onto and off of the counter 42. Such **monitoring** is particularly useful for preventing items which have not been scanned from being placed into...

...grocery bag.
The movement detection floor mat 22 is provided to track movement of a **customer** within a checkout area 44 of the retail **store** . What is meant herein by the term "checkout area" is the area around the self-service checkout terminal 10 in which the **customer** moves about during operation of the terminal 10 to enter and bag items and thereafter...

...detail, the movement detection floor mat 22 is capable of detecting directional movement of the **customer** within the checkout area 44. Such detection capability is distinguished from a simple motion sensor in that the **movement** detection floor mat 22 is capable of determining direction of travel along with **monitoring** **movement** throughout substantially all of the checkout area 44, not simply the area immediately in front of the terminal 10 as would be the case with a simple motion sensor.
The **movement** detection floor mat 22 is preferably constructed of a thin polypropylene laminate that is positioned on or under the carpeting or floor tiles of the **store** . The laminate is approximately 0.002 inches thick and includes tiny "pillows" of foamed plastic an electrical output signal. Such **movement** detection floor mats 22 have been found to be able to detect the breathing of a person laying on the floor. One such **movement** detection floor mat which is suitable for use as the **movement** detection floor mat 22 of the present invention is commercially available from Messet Oy Company...

...disclosure of which is hereby incorporated by reference.
Hence, as shown in FIG. 2, the **movement** detection floor mat 22 may divided into a number of detection zones 22a-22l. Movement into an out of each of the detection zones 22a-22l may be utilized to **track** movement of a customer within the checkout area 44 of the store. In particular, the...

5/3,K/80 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01040026
A FORECOURT ORDERING SYSTEM FOR FUEL AND SERVICES AT A FILLING STATION
BESTELLSYSTEM FUR KRAFTSTOFF UND KUNDENDIENST AN EINER TANKSTELLE
SYSTEME DE PRISE DE COMMANDE EN AVANT-COUR POUR CARBURANT ET SERVICES DANS UNE STATION-SERVICE
PATENT ASSIGNEE:
Marconi Commerce Systems Inc., (570622), 7300 West Friendly Avenue P.O.

Box 22087, Greensboro, North Carolina 27420, (US), (Proprietor designated states: all)
INVENTOR:
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MARION, Kenneth, Orvin, 4702 Horseshoe Lane, Guilford, NC 27410, (US)
LEGAL REPRESENTATIVE:
Fitchett, Stuart Paul (83741), Marconi Intellectual Property, Marrable House, The Vineyards, Gt. Baddow, Chelmsford, Essex CM2 7QS, (GB)
PATENT (CC, No, Kind, Date): EP 1017614 A1 000712 (Basic)
EP 1017614 B1 010905
WO 9916700 990408
APPLICATION (CC, No, Date): EP 98944131 980928; WO 98GB2919 980928
PRIORITY (CC, No, Date): US 60066 P 970926; US 34969 980304; US 119905 980721
DESIGNATED STATES: DE; FR; GB; IT
INTERNATIONAL PATENT CLASS: B67D-005/08
NOTE:
No A-document published by EPO
LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200136	1108
CLAIMS B	(German)	200136	1005
CLAIMS B	(French)	200136	1343
SPEC B	(English)	200136	6267
Total word count - document A			0
Total word count - document B			9723
Total word count - documents A + B			9723

...SPECIFICATION fuel dispensers and systems capable of communicating with various types of transponders and detecting their **movement** within and throughout a fueling environment.
In recent years, traditional gasoline pumps and service stations...

...such as card readers and cash acceptors, to expedite and further enhance fueling transactions. A **customer** is not limited to the purchase of fuel at the dispenser. More recent dispensers allow the **customer** to purchase services, such as car washes, and goods, such as fast food or convenience **store** products at the dispenser. Once purchased, the **customer** need only pick up the goods and services at the station **store** or the outlet of a vending machine. Remote transaction systems have evolved wherein the fuel...

...automatically. Given the sophistication of these transaction systems and the numerous choices provided to the **customer** at the dispenser, conducting transactions with transponders will be useful to allow the dispenser and fuel station **store** to monitor the **movement** of a person carrying a transponder and a vehicle having a transponder, enhance transaction and...

...improve safety in the fueling environment.

Summary of the Invention
The present invention relates to **monitoring** a **customer** position throughout a fueling environment in order to associate orders placed at the fuel dispenser with a particular **customer** at an appropriate receiving point. The receiving point may be a quick-serve restaurant drive...
...receive products or services ordered at the fuel dispenser. In addition to associating the appropriate **customer** with the order being picked up,

operators of a quick-serve restaurant (QSR) can monitor or detect the position of the **customer** in the drive-thru lane or elsewhere in the fueling environment to determine when to start order preparation. For example, during the fueling operation, the **customer** may decide to order a few items from a QSR menu at the dispenser. As...be at the intermediate location.

The present invention solves the unique problems associated with keeping **track** of orders from a QSR in a fueling environment. In such an environment, orders for...detecting the local presence of the transponder associated with a number of vehicles may be **tracked** throughout the fueling environment by one or more antenna arrangements as described in detail in...the car wash interface 48. The multistage ordering disclosed herein provides a solution for keeping **track** of various transactions in a fueling environment where customer orders are picked up in locations...

5/3,K/81 (Item 1 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

01286869

AN ITEM MONITORING SYSTEM AND METHODS OF USING AN ITEM MONITORING SYSTEM

SYSTEME DE SURVEILLANCE D'UN ARTICLE ET METHODES D'UTILISATION DE CE SYSTEME

Patent Applicant/Assignee:

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200593626 A2 20051006 (WO 0593626)

Application: WO 2005US2161 20050124 (PCT/WO US05002161)

Priority Application: US 2004788061 20040226

Designated States:

(All protection types applied unless otherwise stated - for applications 2004+)
AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SM SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LT LU MC NL PL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 24596

Fulltext Availability:
Detailed Description

Detailed Description
... many as 50,000 different SKUs to account for all the unique items in the **store** . That is, each product within a SKU is identical with respect to brand, size, color...

...size or expensive SKUs, such as, for example, a bicycle. However, in general, for most **consumer** items, there will be a plurality of individual items displayed within each SKU and often a plurality of SKUs in a fully stocked display or shelf. The item **monitoring** system of the present invention provides quantitative information about how many items are on the...

...art systems that do not provide information to such a detailed extent.

Third, the item **monitoring** system of the present invention does not require any changes to the **consumer** items or their associated packaging. . The item **monitoring** system of this invention will detect items that are no different from items, that are found in nearly every retail **store** today, as will be apparent from the Examples.). In contrast, prior art systems have required the use of specialized devices attached to each product to **track** the **movement** of the products off the shelves, such as item-level labels, tags, antennae, or inserts...

...manufacturer, distributor or retailer to incorporate such devices into each and every product for the **store** .

Fourth, the item **monitoring** system of the present invention has low power requirements, so that power lines will not...
...small profit margins, the complexity and the number of components or parts of the item **monitoring** system is minimized to reduce system cost. Further, installation and operating costs of the item **monitoring** system are minimal to provide the lowest possible overall costs for the system to the storeowner, manager or operator. .

Figure 1 illustrates one preferred embodiment of the item **monitoring** system 10 of the present invention. The item **monitoring** system 10 is designed to provide information to a user concerning the number or quantity...

5/3,K/82 (Item 2 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

01257513

A VIDEO-BASED SYSTEM AND METHOD FOR COUNTING PERSONS TRAVERSING AREAS BEING MONITORED

SYSTEME VIDEO ET PROCEDE DESTINE A COMPTER LES PERSONNES TRAVERSANT DES ZONES SOUS SURVEILLANCE

Patent Applicant/Assignee:
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TOPAZ Dov, Ofer 27, Mobil Post, Hof HaCarmel, IL, IL (Residence), IL (Nationality), (Designated only for: US)
Legal Representative:
EITAN PEARL LATZER & COHEN-ZEDEK (et al) (agent), 7 Shenkar Street, 46725 Herzlia, IL,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200562714 A2 20050714 (WO 0562714)
Application: WO 2004IL1180 20041229 (PCT/WO IL04001180)
Priority Application: US 2003745630 20031229
Designated States:
(All protection types applied unless otherwise stated - for applications 2004+)
AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LT LU MC NL PL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 13670

Fulltext Availability:
Detailed Description

Detailed Description
... system and method for obtaining and processing information about the quantity and the direction of **movement** of people in crowded areas using video image processing.

BACKGROUND OF THE INVENTION
Monitoring the **movement** of people entering and leaving major public areas, such as malls, **shopping** areas, chain-stores, casinos, airports, bus and train stations and sport facilities provides significant and...

...of entrances and exits
of people to and from a particular doorway of a specific **store** or the number of people passing by or crossing in front of a specific **store** , public area or other area of interest within a period of time, enables the management to evaluate the **store** 's efficiency, and obtain a correlation between the number of visitors and sales. Furthermore, it is possible by checking the number of visitors against 2o employees, to

check the employee/ **customer** ratio to determine whether the staff are overloaded and analyze the **customer** service being obtained vis-a-vis sales. Likewise, by checking a ratio of the number...

...and visual
image processing systems have been developed in order to provide information
about the **movement** of people. Methods and apparatus using video based systems for obtaining information about the movement...

...thus requiring specialized suspension devices.

US Patent No: 5,973,732 to Guthrie, entitled "Object **Tracking** System For Monitoring a Controlled Space", describes video image processing which initially uses low resolution...

...the "gate" or passes through the "turnstile.

The system does not actively search for and **track** figures over the whole videoed area, but identifies the entry and exit of a figure...

5/3,K/83 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01226869 **Image available**
ITEM MONITORING SYSTEM AND METHODS
PROCEDES ET SYSTEME DE SURVEILLANCE D'ARTICLES
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200533645 A1 20050414 (WO 0533645)
Application: WO 2004US32464 20040930 (PCT/WO US04032464)
Priority Application: US 2003507323 20030930
Designated States:
(All protection types applied unless otherwise stated - for applications 2004+)
AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 18851

Fulltext Availability:

Detailed Description

Detailed Description
ITEM MONITORING SYSTEM AND METHODS
FIELD OF THE INVENTION
The invention relates to an item **monitoring** system, an item management system employing information generated by the item **monitoring** system and related methods of managing item inventories and creating sensors used to implement the systems. It further relates to methods for managing or **tracking** movements of inventory items to and from a storage location, for example inventory stored on...

...or surfaces. In particular, one aspect of the invention provides a system and method for **monitoring** the **movement** of items to and from storage locations that is especially, though not exclusively, beneficial in...

...notifications, shrink/theft, and misplaced items, and providing useful information relating to market research on **consumer** selection of items without privacy concerns and brand promotion by demand display and coupon events.

BACKGROUND OF THE INVENTION
A state-of-the-art drug **store** or grocery **store** is reasonably sophisticated with regard to bulk **monitoring** of inventory movements and management of inventory. Most items carry bar code identification to expedite...

...hangers, carry them to a point of sale, such as a checkout station, where the **customer** self checks or a checkout clerk scans each item with a bar code scanner to identify and price the item and to charge it to the **customer** .

Scanning each item's bar code label at the point of sale captures the **movement** of the item out of **store** inventory and is used to initiate actions to replenish the reduced shelf stock. Drawbacks of...

...diminished. Another shortcoming of conventional inventory monitoring techniques is presented by the case where a **consumer** selects a frozen item and then decides for whatever reason to discard the item at...

...is accordingly a need for an item irnonitoring system that can, without requiring operator intervention, **track** addition and removal of items to and from storage locations sufficiently well to be useful...

...are intended to solve, among other things, the problem of how to provide unattended item **monitoring** that can remotely report what items are added to and removed from a storage -volume...

...shelf space. In one embodiment, a structure for storing items is equipped with an item **monitoring** system having a contiguous sensor unit that detects the **movement** of items to and from said hanger and/or said shelf and reports to a...
...inventory changes to a central location, such as a host computer or the like.

A **store** responsible party, such as security office manger, can be kept continually aware of what inventory...

...whenever an item or items are rernoved from a hanger and/or shelf, the

item **monitoring** system can automatically communicate with a host, such as a central server, and/or a...

...item identification, count of the reporting sensor unit and associated data. Of specific interest to **store** security is when a number of items are simultaneously removed indicating the profile of a...

...particularly of interest for known high value and/or high theft items.

- 2 The item **monitoring** system may readily be configured to recognize and report a variety of addition and removal...

...item to read, compares and evaluates then returns it to the shelf or hanger such " **consumer** consideration" is valuable information to the item brand owner as well as the retail organization...
...coupon near certain items could influence favorably a purchase decision thus serving as an in- **store** micro-marketing tool. Embodiments of the invention can therefore recognize particular buying profiles and if...

...influence favorably a buy decision. Further, the invention would be able to follow up by **tracking** the removal of the coupon-linked item within a certain period of time.

Collectively the...

...change to item packaging, the addition of electronic identification and without associating a specific individual **customer** to the change event unless it is for the purpose of security.

hi one broad aspect the invention provides an item **monitoring** system is provided that includes a sensor strip extending in a generally linear fashion. The...

...system of the invention, and their economic significance, a particular field of application is in **tracking** and inventory management of higher priced items, especially grocery and drug store related retail management ...
...and, in one embodiment, communicated by the communication unit 24 to update the item inventory **tracking** database (not shown).

The sensor unit of the lower rod 13 is thus cognizant of...that is most valuable in meeting the wide variety of real world inveritory monitoring and **tracking** problems.

- 16 As has been taught in the disclosure for the item hanger the analog ...such as a server or other computing device, that maintains a central database 52 that **tracks** all item counts as well as other status and location data. One communication technique is...

...uniquely identify each item on its sensor surface for purposes of an individual stock item **tracking** and monitoring use. With respect to the inventory map mentioned above, the central host 50...

5/3,K/84 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

01168945
OBTAINING PRODUCT ITEM ASSISTANCE

OBTENTION D'ASSISTANCE CONCERNANT UN PRODUIT

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Patent and Priority Information (Country, Number, Date):
Patent: WO 200490803 A1 20041021 (WO 0490803)
Application: WO 2004AU437 20040402 (PCT/WO AU04000437)
Priority Application: AU 2003901617 20030407; AU 2003901795 20030415

Designated States:
(All protection types applied unless otherwise stated - for applications 2004+)
AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English
Filing Language: English
Fulltext Word Count: 123002

Fulltext Availability:
Detailed Description

Detailed Description
... replacing the UPC scheme to allow individual product items to be uniquely identified and thereby **tracked** . Individual item tagging can reduce "shrinkage" due to lost, stolen or spoiled goods, improve the...

...incorporated by cross-reference.

EPCs are intended not just for unique item-level tagging and **tracking** , but also for 1 5 case-level and pallet-level tagging, and for tagging of ...

...dynamic hierarchy of packaging, shipping and transportation units, each identified by its own unique EPC. **Tracking** of higher-level units through the supply chain implicitly support the **tracking** of lower-level 1 0 units. For example, once a pallet is loaded and until it is unloaded and split, pallet-level **tracking** is sufficient to also **track** its case-level content. Similarly, once a carton is filled and until it is re-opened and split, case-level **tracking** is sufficient to also **track** its item-level content. Readers installed in entry and exit portals in factories, warehouses, distribution centers and retail stores can automatically **track** unit movements and update movement 1 5 histories. Notwithstanding issues with automatically **tracking** radiopaque product,

RFID readers have benefits for pallet-level and case-level **tracking** .

At the checkout, the unique EPC of the item prevents it from being recorded as...demand are delivered to the printer through which the user is interacting. The server keeps **track** of which publishers a user has authorized to print to the user's default printer...is moved relative to a HyperlabelT@11 tagged surface region, it is thereby able to **track** its own motion relative to the region and generate a set of timestaraped position samples...EPC scan data, legacy database systems will typically be enhanced to support the description and **tracking** of EPC-tagged containers and product items. Some scan events result in message flow between...

...shipping systems record the container hierarchy. This allows the contents of a container to be **tracked** by simply **tracking** the container.

When a retailer receives a case, it is scanned into inventory at the...

5/3,K/85 (Item 5 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT
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01167240 **Image available**

LASER SCANNING DEVICE FOR PRINTED PRODUCT IDENTIFICATION CODES
DISPOSITIF DE BALAYAGE LASER POUR CODES D'IDENTIFICATION DE PRODUITS IMPRIMES

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Patent and Priority Information (Country, Number, Date):
Patent: WO 200490796 A1 20041021 (WO 0490796)
Application: WO 2004AU401 20040402 (PCT/WO AU04000401)
Priority Application: AU 2003901617 20030407; AU 2003901795 20030415

Designated States:
(All protection types applied unless otherwise stated - for applications 2004+)
AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 102745

Fulltext Availability:
Detailed Description

Detailed Description
... replacing the UPC scheme to allow individual product items to be uniquely identified and thereby **tracked** .

Individual item tagging can reduce "shrinkage" due to lost, stolen or spoiled goods, improve the...

...incorporated by cross-reference.

EPCs are intended not just for unique item-level tagging and **tracking** , but also for case-level and pallet-level tagging, and for tagging of other logistic...

...dynamic hierarchy of packaging, shipping and transportation units, each identified by its own unique EPC. **Tracking** of higher-level units through the supply chain implicitly support the **tracking** of lower-level units. For example, once a pallet is loaded and until it is unloaded and split, pallet-level **tracking** is sufficient to also **track** its case-level content.

Similarly, once a carton is filled and until it is re-opened and split, case-level **tracking** is sufficient to also **track** its item-level content. Readers installed in entry and exit portals in factories, I 0 warehouses, distribution centers and retail stores can automatically **track** unit movements and update movement histories. Notwithstanding issues with automatically **tracking** radiopaque product, RFID readers have benefits for pallet-level and case-level **tracking** .

At the checkout, the unique EPC of the item prevents it from being recorded as...a modification to the motion of the conveyor.

Preferably the check-out is adapted to **store** scan data indicative of the identity of the product item in memory.

Preferably the check...demand are delivered to the printer through which the user is interacting. The server keeps **track** of which publishers a user has authorized to print to the user's default printer...device is moved relative to a Hyperlabel tagged surface region, it is thereby able to **track** its own motion relative to the region and generate a set of timestamped position samples...

...EPC scan data, legacy database systems will typically be enhanced to support the description and **tracking** of EPC-tagged containers and product items. Some scan events result in message flow between...

...record the container hierarchy. This allows the contents of a 1 0 container to be **tracked** by simply **tracking** the container.

When a retailer receives a case, it is scanned into inventory at the...

5/3,K/86 (Item 6 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

01167239 **Image available**

SENSING DEVICE FOR CODED DATA

DISPOSITIF DE DETECTION POUR DONNEES CODEES

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Patent and Priority Information (Country, Number, Date):
Patent: WO 200490798 A1 20041021 (WO 0490798)
Application: WO 2004AU400 20040402 (PCT/WO AU04000400)
Priority Application: AU 2003901617 20030407; AU 2003901795 20030415
Designated States:
(All protection types applied unless otherwise stated - for applications 2004+)
AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 98184

Fulltext Availability:
Detailed Description

Detailed Description
... demand are delivered to the printer through which the user is interacting. The server keeps **track** of which publishers a user has authorized to print to the user's default printer...device is moved relative to a Hyperlabel tagged surface region, it is thereby able to **track** its own motion relative to the region and generate a set of timestamped position samples...
...ownership. As the figure shows, a container 231 (e.g. case, pallet, shipping container, or **track**) is a special case of an uniquely identified object 230. The fact that the container...

...EPC scan data, legacy database systems will typically be enhanced to support the description and **tracking** of EPC-tagged containers and product items. Some scan events result in message flow between...

...shipping systems record the container hierarchy. This allows the contents of a container to be **tracked** by simply **tracking** the container.

When a retailer receives a case, it is scanned into inventory at the... specific help page can be linked to the entire product manual.

8 4 Product Ownership **Tracking**
I 0 If the entire surface of a product is Hyperlabel tagged, then pressing on...that this applies equally to items shoplifted via an auto-checkout.

If and when the **customer** decides to return a legitimately-purchased item to a retail store because the item is...
...link to information which confirms that the item has been legitimately obtained from the same **store** or the same retail chain.

This prevents fraudulent returns, such as the attempted "return7' of...

...safety stock. Demand-driven efficiencies then flow back up the supply chain.

Case-level RFID **tracking** in the backroom, coolroom and freezer, either during case 5 **movement** or in situ, allows accurate backroom stock **monitoring** . Case-level RFID **tracking** onto the sales floor allows accurate recording of shelf-stock additions, and item-level **tracking** at the checkout allows accurate recording of shelf-stock removals.

Imminent out-of-stock conditions...

...the backroom.

Unlike with UPCs, poor shelf stock rotation is easily detected via item-level **tracking** at the checkout. If newer stock of a product is inadvertently sold in preference to...
...and Hyperlabel solutions
RFID Hyperlabel
pain point solution solution
receiving accuracy case-level case-level
tracking and some **trackine**
item-level **tracking**
on-hand stock visibility case-level case-level
trackine and item- **trackine** and item
level **tracking** using level **tracking** at the

smart shelves and at checkout
the checkout
replenishment from the case-level case-level
backroom **trackine** and item- **trackine**
level **tracking**
plan-o-gram compliance manual and manual
product lifecycle management smart shelves'
cycle counting / manual...

...When a uniquely tagged item is travelling through the supply chain and benefits from being **tracked** , this promiscuity is useful, but once the item is purchased by a customer and no longer needs to be **tracked** , it can become a problem. The owner of the item may have no idea that...
...many cases much ftuther. If the RFID tag contains a unique item ID, then for **tracking** purposes the item ID becomes a pointer to the person, particularly if the RFED is...

...RFID tags carTied by a particular person may still constitute a sufficiently unique signature for **tracking** purposes.

Hyperlabel tags are less promiscuous than RFIDs since they require line-of-sight for...an inverter with self feedback. The advantages of this circuit are its simplicity, and automatic **tracking** of the supply voltage and process comers.

The switch is used to cut off the...

5/3,K/87 (Item 7 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01077435 **Image available**
PLAYER TRACKING **ASSEMBLY**
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Patent and Priority Information (Country, Number, Date):
Patent: WO 2003107287 A1 20031224 (WO 03107287)
Application: WO 2003US18826 20030612 (PCT/WO US0318826)
Priority Application: US 2002170278 20020612
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English
Filing Language: English
Fulltext Word Count: 6682

PLAYER TRACKING **ASSEMBLY**

Fulltext Availability:
Detailed Description
Claims

English Abstract

A player **tracking** system for **tracking** customer activity for a casino establishment having gaming sections and non-gaming sections. The player **tracking** system includes a plurality of player **tracking** cards for distribution to respective participating customers that incorporate respective customer accounts associated with respective customer IDs. The system further includes a plurality of gaming activity player **tracking** units positioned in the gaming section of the casino establishment proximate the gaming activity which cooperates with the player **tracking** cards to monitor the gaming activity data of the respective customer, and a plurality of non-gaming activity player **tracking** units positioned in the non-gaming section of the casino establishment proximate the non-gaming activity which cooperates with the player **tracking** cards to monitor the non-gaming activity data of the respective customer. A computer system...

...of the respective customer accounts associated with respective customer Ids, and each gaming activity player **tracking** unit and each non-gaming activity player **tracking** unit coupled to the computer system to process the respective gaming activity data and non...

Detailed Description

PLAYER **TRACKING** ASSEMBLY

BACKGROUND OF THE INVENTION

The present invention relates generally to player **tracking** services one gaming machines, and more particularly, relates to complete patron **tracking** of all casino activity.

There are a wide variety of associated devices that can be...

...slot machine or video poker machine. Some examples of 1 0 these devices are player **tracking** units, lights, ticket printers, card readers, speakers, bill validators, ticket readers, coin acceptors, display panels ...

...of attaining and/or maintaining a game player's interest in game play are player **tracking** programs which are offered at various casinos. Player
I
tracking programs provide rewards to players that typically correspond to the player's level of patronage...
...s playing frequency and/or total amount of game plays at a given casino). Player **tracking** rewards may include free meals, free lodging and/or free entertainment. These rewards may help...

...player to visit a gaming establishment to partake in various gaming activities.

In general, player **tracking** programs may be applied to any game of chance offered at a gaming establishment. In particular, player **tracking** programs are very popular with players of mechanical slot gaming

machines and video slot gaming machines. In a gaming machine, a player **tracking** program is implemented using a player **tracking** unit installed in the gaming machine and in communication with a remote player **tracking** server.

Due to their increasing popularity, player **tracking** cards and player **tracking** 5 programs have essentially become the de facto marketing method of doing business at casinos. As suggested above, a player's incentive for using the player **tracking** services is awards provided by the gaming machine operator (e.g., the casino). Some incentives of a casino for providing player **tracking** services is to generate "brand" loyalty, gather valuable information that may be used for marketing...

...valuable to the casinos.

Gaming establishments are continually searching for new and innovative techniques to **track** patron activity to improve casino operations and marketing. Thus, while these current **tracking** systems are adequate, they are limited mainly to gaming play and Point-Of-Sales events. It would be desirable, accordingly, to provide an apparatus and method for player **tracking** programs that allow the casinos to expand such player **tracking** to include all casino activity.

SUMMARY OF THE INVENTION

The present invention provides a player **tracking** system for **tracking** customer activity for a casino establishment having gaining sections and non-gaming sections.

The **tracking** system includes a plurality of player **tracking** cards adapted for distribution to respective participating customers of the **tracking** program. These
2
cards include respective customer IN which are associated with respective customer accounts, The system further includes a plurality of gaming activity player **tracking** units positioned in the gaining section of the casino establishment proximate the gaming activity. These activity player **tracking** units cooperate with the player **tracking** cards to monitor the gaming activity data of the respective customer. A plurality of non-garning activity player **tracking** units are also positioned about the casino establishment in the non-gaming sections thereof which cooperate with the player **tracking** cards to monitor the non-gaming activity data of the respective customer. A computer system of the player **tracking** system includes a database of the respective customer accounts associated with respective customer Ids. Each gaming activity player **tracking** unit and each non-gaming activity player **tracking** unit is coupled to the computer system to process the respective gaming activity data and...

...each respective customer.

Accordingly, not only is the gaining activity monitored, similar to current player **tracking** programs, but non-gaining activity is also monitored. Most notably, patron movement throughout the casino...

...activity data and non-gaming data.

In one specific embodiment, the non-gaming activity player **tracking** unit
includes a wireless interface configured to detect the presence of a respective player **tracking** card in the local vicinity of the respective non-gaming section of the casino establishment...

...selected, respective non-gaming sections of the casino establishment. Thus, the non-gaming activity player **tracking** unit can detect when a respective customer enters and/or exits a particular respective non...

...casino theater, a casino bar or a casino showroom.

In another embodiment, the respective player **tracking** card is a Radio Frequency (RF) enabled smart card configured to generate an RF signal...

...time period.

3

In another aspect of the present invention, a method is included for **tracking** customer activity at a casino establishment having gaining sections and non-gaming sections, at a...

...sections and non-gaming sections.

The method includes monitoring at least one gaming activity player **tracking** unit in the gaming section of the casino establishment for gaming activity data by a respective customer; and monitoring at least one non-ganiing activity player **tracking** unit in the non-gaming section of the casino establishment for non-gaming activity data by the respective customer.

The monitoring the at least one gaming activity player **tracking** unit includes detecting the presence of a respective player **tracking** card in the local vicinity of the respective non-gaming section of the casino establishment through a wireless interface component of the non-gaming activity player **tracking** unit.

In another specific embodiment, the method includes placing the non-gaming activity player **tracking** unit proximate one of an entrance and an exit of a selected, respective non-gaming...

...respective customer into and out of the respective nongaming section. The method may ftirther include **tracking** patron movement of the respective customers in the non-gaming sections of the casino establishment...

...with the accompanying drawing, in which.

FIGURE I is a block diagram of a player **tracking** system constructed in accordance with the present invention having gaming activity player **tracking** units and non-gaming activity player **tracking** units.

FIGURE 2 is a block diagram of the components of the gaming activity player **tracking** unit and the non-gaming activity player **tracking** unit of player **tracking** system of FIGURE 1.

FIGURE 3 is a block diagram of the components of a...

...the various figures.

Attention is now directed to FIGURES I and 2 where a player **tracking** system, generally designated 20, is illustrated for **tracking** customer activity for a casino establishment having gaming sections 21 and non-gaming sections 22. The **tracking** system 20 includes a plurality of player **tracking** identification devices 23 adapted for distribution to respective participating customers of the **tracking** program.

These devices 23 include respective customer IDs which are associated with respective customer accounts. The system 20 further includes a plurality of gaming activity player **tracking** units 25 positioned in the gaining section 21 of the casino establishment 26. These activity player **tracking** units 25 cooperate with the player **tracking** identification devices 23 to monitor the gaming activity data of the respective **customer** . A plurality of non-gaming activity player tracking units 27 are also positioned about the...

...player tracking identification devices 23 to monitor the non-gaming activity data of the respective **customer** . A computer system, generally designated 28, of the player tracking system 20 includes a database of the respective **customer** accounts associated with respective **customer** Ids. Each gaming activity player tracking unit 25 and each non-gaming activity player tracking...

...to process the respective gaming activity data and non-gaming activity data for each respective **customer** .

Accordingly, this tracking system would enable the casino establishment to monitor both gaming activity and non-gaming activity within the casino. The conventional **monitoring** of gaming activity is well known, and has been successfully applied throughout the industry. Extending such **monitoring** to other non-gaming activity, however, is relatively new, but may prove to be just...

...gaming
5
section 22 of the casino establishment. Thus, one form of non-gaming activity **monitoring** would be the **tracking** of patron□movement□ throughout the establishment in such non-gaining avenues of the casino as theater, **shopping** and restaurants. By recording the time of entrance and exit of a patron in a particular **store** or restaurant, the casino establishment can monitor and analyze their tendency to shop particular stores...

...particular restaurants. Using the combined gaming activity data and non-gaming activity data, promotions and **customer** service programs can be more customized toward the respective **customer** . monitored which enables the casino establishment to better customize promotional awards to the respective **customer** based upon their past attendance at the particular non-gaming sections.

By way of example...
...Moreover, other promotions from other casino restaurants or stores can be directed toward that respective **customer** to entice patronage at those the **customer** does not frequent. The ability for casinos to **track** the activity of card carrying patrons through their entire visit to casinos would provide the...

...addition, it could add another level to customer service.

In still other applications, the player **tracking** system 20 could identify the participating patron through their player **tracking** identification device as they entered a restaurant or shop. A host or sales consultant could...

...the block diagram is provided which broadly
illustrates the computer system 28 of the player **tracking** system 20 having a central player **tracking** /accounting server 30. The player

tracking account server is typically configured to A) store player **tracking** account information relating to a player's previous game play, B) store player **tracking** account information relating to a 6 player's historical frequency (E.g., the date and time spent) in the selected nongaming sections of the casino, Q calculate player **tracking** points based on a player's game play that may be used as basis for providing rewards to the player; and D), calculate player **tracking** points and promotions based on a player's frequency at the selected non-gaming sections. The system is further defined, as mentioned, by a plurality of gaming activity player **tracking** units 25 to monitor the gaming activity data received from their corresponding gaming activity interfaces. This gaming activity component, as will be described, is essentially provided by conventional player **tracking** technology. Further coupled to the player **tracking** server, in I 0 accordance with the present invention, is a plurality of non-gaming activity player **tracking** units 27 which monitor the non-gaming activity data received from corresponding non-garning activity...

...sections.

As mentioned, the present invention includes a conventional gaming activity component of the player **tracking** system similar to those currently in widespread 1 5 application. Briefly, as illustrated in FIGURE 1, the block diagram of a number of gaming machines with gaming activity player **tracking** units is illustrated connected to servers providing player **tracking** services. For example, in casino establishment 26, gaming machines 31, 32 and 33 are connected, via the data collection unit (DCU) 37 to the computer system or player **tracking** /accounting server 30. The DCU 37, which may be connected to up to thirty-two (32) gaming activity player **tracking** units as part of a local network in a particular example, consolidates the information gathered from player **tracking** units in gaming machines 31, 32 and 33 and forwards the information to the player **tracking** account server 30.

In gaming machine 31 of casino establishment 26, a gaming activity player **tracking** unit 25 and slot machine interface board (SMIB) 40 are mounted within a main cabinet 41 of the gaming machine. In many types of gaming machines, the player **tracking** unit is mounted within a top box 42 positioned stop the gaming machine cabinet 41. Usually, player **tracking** units, such as 25, and SMIBs, such as 40, are manufactured as separate units before installation into a gaming machine 3 1.

Typically, the gaming activity player **tracking** unit 25 includes three player **tracking** devices: a gaming activity card reader 43; a key pad 45; and a display 46, all mounted within the unit. These player **tracking** devices are associated with a wired Input/Output Interface 35, and are used to input player **tracking** information that is needed to implement the player **tracking** program. As will be described in greater 7 detail below, the player **tracking** unit 25 may include a wireless Input/Output Interface 36 as well. The gaming activity component of player **tracking** system 20 may be mounted in many different arrangements depending upon design constraints such as...

...of a gaming machine and a configuration of a gaming machine. For instance, the player **tracking** devices may be mounted flush with a vertical surface in an upright gaming machine and...

...angle upward with a horizontal in a flat top gaining machine.

The gaming activity player **tracking** unit 25 communicates with the player
tracking server via the SMIB 40, a main communication board 47 and the DCU 37.

The SMEB 40 allows the player **tracking** unit 25 to gather information from the gaming machine 31 such as an amount a...

...has wagered during a game play session. This information may be used by the player **tracking** server 30 to calculate player **tracking** points for the player. The gaining activity player **tracking** unit 25 is usually connected to the master gaming controller 48 via a serial connection...

...SAS protocol) developed by International Game Technology of Reno, NV to communicate with the player **tracking** unit 25.

In one particular embodiment, by way of example, when a game player desires...

...play a game on a gaining machine and utilize the gaming activity component of player **tracking** system 20 available through the player **tracking** unit, a game player inserts their issued player **tracking** identification device 23, such as a magnetic striped card, into the card reader 43. Briefly, for current player **tracking** programs, the most common approach for providing identification information is to issue a magnetic-striped...

...the necessary identification information to each player that wishes to participate in a given player **tracking** program. It will be appreciated, however, as will be better described below, that the issued player
8
tracking identification device 23 may be wireless interfaces such as Radio Frequency (RF) enabled smart cards and/or wireless Personal Digital Assistants (PDA) which enable wireless communication with the player **tracking** server. Accordingly, wireless cominunication may be provided for both the gaming activity player **tracking** unit 25 and the non-gaming player **tracking** unit 27.

After the magnetic striped or smart card has been so inserted, the gaming activity player **tracking** unit 25 may detect this event and receive certain identification information contained on the card. For example, a player's name, address, social security number and player **tracking** account number encoded on the magnetic striped card, may be received by the player **tracking** unit 25. In general, a player must provide identification information of some type to utilize player **tracking** services available on a gaining machine.

Once the player has inserted her or his player **tracking** card into the gaining activity card reader 43, the player **tracking** unit 25 may command the touch screen 5 display 46 to display the game player...

...with an alphanumeric key pad displayed on touch screen display 46 or through a player **tracking** input keypad. For example, the player may use their finger, a stylus or combinations thereof...
...the touch screen sensor. Once the game player's identity has been validated, the player **tracking** information is relayed to the player **tracking** server 30. Typically, the player **tracking** server 30 stores player **tracking** account records including the number of player **tracking** points previously accumulated by the player. Using this gaming

activity data, the casino establishment may monitor their gaining activity for future promotions and customer service. Some player **tracking** systems, for example, incorporate management programs which update and calculate theoretical win profiles for each...

...activity of the customer at the casino establishment over a time period.

Details of player **tracking** units with peripheral devices operated by a master gaming controller are described in co-pending...

...09/838,033, filed 4/19/01, by Criss-Puskiewicz, et al, titled "Universal Player **Tracking** System," which is incorporated herein in its entirety and for all purposes and co-pending...

...192, filed 8/18/00, by LeMay, et
9
al, titled "Gaining Machine Virtual Player **Tracking** Services," which is incorporated herein in its entirety and for all purposes. Moreover, details of player **tracking** systems with wireless player **tracking** identification devices are described in copending U.S. patent application No. : 09/921,489, filed 8/3/01, by Hedrick, et al, titled "Player **Tracking** Communication Mechanisms in a Gaming Machine" which is incorporated herein in its entirety and for all purposes
With respect to the non-gaming player **tracking** unit 27 (FIGURE 2), wireless communication is necessary to maintain any ability to monitor patron...

...22 of the casino establishment without inconveniencing the customer. Thus, the non-gaming activity player **tracking** unit 27 of the **tracking** system includes a wireless interface 49 configured to locally communicate with the respective wireless identification...

...issued to that customer. In this manner, movement of the patron can be detected and **tracked** in the selected non-gaming sections of the casino establishment without requiring a manual input...

...RF) enabled smart card 50, which has a footprint about the size of a player **tracking** card, or a portable wireless device, such as a Personal Digital Assistant (PDA) carried or...
...section 22 of the casino, the respective wireless interface 49 may automatically detect the player **tracking** identification device 23 carried by the player (or they may automatically detect each other) to...

...The wireless interfaces 49, therefore, should only be capable of local detection of the player **tracking** identification devices 23 so that the wireless player **tracking** units at adjacent non-gaming sections, or even the same section, will not improperly detect...

...Radio Frequency (RF) enabled smart card which can be applied in both the gaming activity **tracking** unit 25, and the non-gaming **tracking** unit 27. For instance, FIGURE 3 illustrates a block
1 1
diagram of the components...

...terminal or some other gaming device, or use with the wireless interface 49 of the **tracking** unit 27 situated in the nongaming section 22 of the casino. The smart card 50...

...58 which permits the smart card 50 to communicate with the non-gaming activity player **tracking** unit 27, and/or the gaming activity player

tracking unit 25 residing on a gaining machine, a gaining peripheral, a gaming terminal or some...

...with the present invention, the wireless smart card readers 58 of non-gaming activity player **tracking** units 27 are preferably provided by strategically positioned around the casino establishment to **track** and monitor movement of the player **tracking** participating customers. In particular, for casino non-gaining sections 22 such as restaurants, shops, theaters...assistant (PDA) that executes gaming applications, and may communicate with the non-gaming activity player **tracking** unit 27 or gaming activity player **tracking** unit at the gaming machine via a wireless communication interface.

One example of a PDA...

Claim
I . A system for **tracking** customer activity, using player **tracking** cards issued to respective customers that include respective customer I]Ds which are associated with...

...gaining sections and
non-gaming sections, said system comprising:
at least one gaming activity player **tracking** unit in the gaming section of the casino establishment which cooperates with the player **tracking** cards to monitor the
gaming activity data of the respective customer; and
I 0 at least one non-gaming activity player **tracking** unit in the non-gaming section of the casino establishment which cooperates with the player **tracking** cards to
monitor the non-gaming activity data of the respective customer.

2 The system of claim 1, wherein
said non-gaming activity player **tracking** unit includes a wireless interface 1 5 configured to detect the presence of a respective player **tracking** card in the local vicinity of the respective non-gaming section of the casino establishment.
3 The system of claim 2, wherein
said non-gaming activity player **tracking** unit is configured for placement proximate an opening into the respective non-gaming section to
...

...RF) receiver.

5 The system of claim 1, wherein
said non-gaming activity includes the **tracking** of patron movement in said
casino establishment.

6 The system of claim 1, further including...

...accounts
associated with respective customer Ids, and each said at least one gaming activity player **tracking** unit and the at least one non-gaming activity player **tracking** unit coupled to the computer system to process the respective gaming activity data and
non...

...period.
8 The system of claim 7, wherein
said at least one gaming activity player **tracking** unit includes a card

reader device coupled to the computer system to read customer identity information from the respective player **tracking** card and provide the customer identity information to the computer system.

9 A player **tracking** system for **tracking** customer activity for a casino establishment having gaming sections and non-gaming sections, said system comprising:
a plurality of player **tracking** cards for distribution to respective participating customers that include respective customer II)s which are associated with respective customer accounts;
1 5 a plurality of gaining activity player **tracking** units positioned in the gaming section of the casino establishment proximate the gaming activity which cooperates with the player **tracking** cards to monitor the gaming activity data of the respective customer;
a plurality of non-gaming activity player **tracking** units positioned in the nongaming section of the casino establishment proximate the non-gaming activity which cooperates with the player **tracking** cards to monitor the non-gaming activity data of the respective customer; and
a computer...

...of the respective customer accounts associated with respective customer Ids, and each gaming activity player **tracking** unit and each non-gaming activity player **tracking** unit coupled to the computer system to process the respective gaming activity data and non...

...each respective customer.

10 The system of claim 9, wherein said non-gaming activity player **tracking** unit includes a wireless interface configured to detect the presence of a respective player **tracking** card in the local vicinity of the respective non-gaming section of the casino establishment.

11 The system of claim IO, wherein said non-gaming activity player **tracking** unit is configured for placement proximate the entrances and exits of selected, respective non-gaming...

...over a time period.

15 The system of claim 14, wherein each gaming activity player **tracking** unit includes a card reader device 5 coupled to the computer system to read customer identity information from the respective player **tracking** card and provide the customer identity information to the computer system.

16 The system of claim 10, wherein said respective player **tracking** card is a Radio Frequency (RF) enabled smart card configured to generate an RF signal...

...is a Radio Frequency (RF) receiver responsive to said

RF signal.

17 A method for **tracking** customer activity, using player **tracking** cards issued to respective customers that include respective customer IDs which are associated with respective...

...sections and non
gaming sections, said method comprising:
monitoring at least one gaming activity player **tracking** unit in the gaming section of the casino establishment for gaming activity data by a respective customer;
and
monitoring at least one non-gaming activity player **tracking** unit in the nongaming section of the casino establishment for non-garning activity data by...

...The method of claim 17, wherein
16
said monitoring at least one gaining activity player **tracking** unit includes detecting the presence of a respective player **tracking** card in the local vicinity of the respective non-gaming section of the casino establishment through a wireless
interface component of the non-gaining activity player **tracking** unit.

19 The method of claim 18, wherein
said respective player **tracking** card is a Radio Frequency (RI) enabled smart
card configured to generate an RF signal...

...signal.

20 The method of claim 18, further including:
placing the non-gaming activity player **tracking** unit proximate one of an
entrance and an exit of a selected, respective non-gaming...

...a casino bar and a casino showroom.

22 The method of claim 20, further including:
tracking patron movement of the respective customers in the non-gaming sections of the casino establishment...

...of the gaming activity data includes reading the customer identity information from the respective player **tracking** card through a card reader device.
17

5/3,K/88 (Item 8 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

01071914 **Image available**
SUPPLY CHAIN MANAGEMENT USING ITEM DETECTION SYSTEM
GESTION DE CHAINE D'APPROVISIONNEMENT UTILISANT UN SYSTEME DE DETECTION D'ARTICLE
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Legal Representative:
ROCKE Carsten (agent), Muller-Bore & Partner, Grafinger Str. 2, 81671 Munchen, DE,
Patent and Priority Information (Country, Number, Date):
Patent: WO 2003102864 A2-A3 20031211 (WO 03102864)
Application: WO 2003EP5869 20030604 (PCT/WO EP03005869)
Priority Application: US 2002384826 20020604; US 2003372671 20030225
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 10933

Fulltext Availability:
Detailed Description

Detailed Description
... systems is to decrease inventory without decreasing the ability to provide goods when needed. Accurately **tracking** inventory and the movement of goods or items and providing this information `upstream!' (to a...

...1D) is a technology that leverages electromagnetic or electrostatic coupling to allow items to be **tracked** electronically without requiring direct contact or line-of-sight scanning of the items. Typical RF...

...antenna, a reader, and a tag that may be attached to an item to be **tracked** . The antenna uses radio frequency waves to activate the tag. The activated tag transmits data...

...that is subsequently interpreted by the reader, The data may be used to identify and **track** the item.

SUMMARY
In one general aspect, a system to monitor item placement and item...

...identification values of the items received by the master reader MPU 1 1 0 to **track** the movement of items to and from the shelf 250. Furthermore, the computer 105 also...

...The item identification system 100 may be employed in supply chain management systems to keep **track** of items that are placed on shelves.

For example, the computer 105 of the item...reader WUs II 0 to allow a user or other entity to monitor and keep **track** of the location and movement of items on one or more shelves similar to shelf 250. The monitoring and **tracking** of item movements to and from shelves is also of particular value for retail store...

...shelf watch application may be of particular use in retail stores or warehouses to keep **track** of inventory in real time. For example, the shelf watch application may receive item identification...

...warehouse. The item identification data may be processed by the shelf watch application to keep **track** of the items placed on the multiple shelves in a similar manner as that described above with respect to Figs. 7 and 8. Item inventory may be **tracked** by, for example, totaling the number of items placed on all of the store shelves...

...to optimize or improve the
placement of items on warehouse and retail store shelves by **tracking** patterns of item movement. By changing item assignment locations and subsequently monitoring the resulting item...

...watch application may send a message to an entity when an event relating to item **movement** occurs. The event may include those discussed above with respect to inventory management and item placement optimization but also may
17
include events that are specifically directed to **monitoring customer** behavior. For example, a retailer may desire to **track** the effect of item price changes on **customer** behavior as derived from **movement** and subsequent purchases of items. Specifically, a retailer may desire to receive a message when...

...not put back, and subsequently not reflected in a packing slip or other warehouse item **tracking** mechanism after a predetermined time.

The retailer (i.e., retail **store** manager) or warehouse manager may receive event messages and monitor item **movement** by accessing the computer 105 of the item identification system 100. The computer 105 may
...
...a Public Switched Telephone Network (PSTN), an Integrated Services Digital Network (ISDN), or a Digital **Subscriber** Line (xDSL)), and a delivery mechanism for carrying data (e.g., radio, television, cable, or
...

...example, Elvin, CosNotif, JMS, Keryx, and Gryphon CBM services.

Referring to Fig. 9, an asset **monitoring** system 900 may include one or more item identification systems 905 that distribute item-related data on a real-time or near-real-time basis to one or more asset **monitoring** systems 9 1 0 using a content based messaging (CBM) service network 915.

The item identification systems 905 may be used by warehouse or retail **store** managers to detect and publish data related to items placed on all of the shelves in a given location such as, for example, a retail **store** or a warehouse. Each item identification system 905 typically has attributes comparable to those described...

...from the item identification systems 905 and generate notifications that are transmitted to the asset **monitoring** systems 91 0 that subscribe to the data. The filtering server may compute the registered...

...The manufacturer receives the unprocessed identification data using the asset monitoring system 910. The asset **monitoring** application of the asset **monitoring** system 9 1 0 processes the item identification data to determine the total number of items per product name for the given item manufacturer per retail **store** (i.e., the total number of items in the **store** having the same manufacturer and product name in the item ID). In another implementation, the...

...manufacturer instead of or in addition to publishing the unprocessed item identification data. The asset **monitoring** application then receives directly from the CBM network 915 the total number of items per product name for the given manufacturer per retail **store** .

20
Referring to Fig. IO, the asset **monitoring** application may provide a user interface 1000 that displays the total number of items per product name for a given manufacturer per retail **store** . The interface 1000 includes a header 1005 displaying a name of the manufacturer (e.g...

...2) the name of the product 1025; and (3) the number of products in the **store** 1030 (i.e., the number of items with item [Ds that include the manufacturer and...
...another implementation, the product entries 10 1 5 may further include the name of the **store** corresponding to the product entry 1015 being displayed (e.g., " **store** I"). The interface 1000 may include a window 1040 that displays more detailed item identification data retrieved by the asset **monitoring** system 91 0.

A number of implementations have been described. Nevertheless, it will be understood that various modifications may be made. For example, the asset **monitoring** application described with respect to Figs. 9 and I 0 may run on the same...

...watch application or on a computer in the same LAN. In this implementation, the asset **monitoring** application may be used by a retail **store** manager to keep track of the **store** inventory and observe behavior of customers in a similar fashion as that described above with ...

5/3,K/89 (Item 9 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

01053692 **Image available**
SYSTEM AND METHOD FOR AUTOMATED MONITORING, RECOGNIZING, SUPPORTING, AND RESPONDING TO THE BEHAVIOR OF AN ACTOR
SYSTEME ET PROCEDE AUTOMATISES DE SURVEILLANCE, DE RECONNAISSANCE, D'ASSISTANCE ET DE REPONSE ASSOCIEES AU COMPORTEMENT D'UN UTILISATEUR
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Legal Representative:
CRISS Roger H (et al) (agent), Honeywell International Inc., 101 Columbia Road, P.O.Box 2245, Morristown, NJ 07960, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200383800 A1 20031009 (WO 0383800)
Application: WO 2003US9743 20030328 (PCT/WO US0309743)
Priority Application: US 2002368307 20020328; US 2003341335 20030110
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SK
SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 16957

Fulltext Availability:
Detailed Description

Detailed Description
... system performance available at several levels of computational responsibility, from device control to user task **tracking** .

The model of the preferred system 20 is expressed in an ontology and agent communication...reasoning modules for specific behaviors are incorporated into the system 20 architecture (e.g., a **tracking** algorithm that I 0 calculates the user's path based on motion-sensor events), and...actor, the actors environment and/or caregivers. Preferably, the controller further 1 5 includes data **tracking** , logging and machine learning algorithms to control and detect trends and individual behavior patterns across...analysis.

Provide easy method that caregiver can enter medical and care information.

Provide caregiver task **tracking** capability to coordinate efforts of multiple caregivers.

Provide dedicated caregiver information exchange UI facility.

0...the actor and can be used to summon help.

Detect number of people in home.

Track actor's motion, recognize gait, predict problems (obstacles, ...and how they should be taken (e.g., with food?).

Provide an automated dispenser to **track** drugs taken and monitor time taken.

...to reduce stress, etc.

Detect confusion.
Detect agitation.

N Trend memory.

Trend toileting.

Eatin
0 **Track** food for expiration dates and advise resident to dispose of food if too I 0...

...used.

0 Automatically generate shopping list based on meal planning/nutritional goals.

1 5 N **Track** nutritional value of meals, and alert caregiver and actor if eating inappropriately.

0 Monitor food...0 Monitor storage conditions (fridge and freezer temperatures to ensure food is cold enough).

0 **Track** schedule of food delivery and alert caregiver/actor/care organization if food delivery does not...management resources.

0 Checking account interlocks to prevent payments to unauthorized persons or organizations.

a **Visitor** screening to deter door-to-door solicitors.

0 Support regular social contact to reduce sense...caregivers.

Provide reminders to use the bathroom.

Provide path lighting and obstacle detection for nighttime **movement** between bedroom and bathroom.

Increased **monitoring** sensitivity based on actor's medical conditions (e.g., if
known that actor has reduced...clothes.

Provide information about local housekeeping resources.

Task prompts or step-by-step instructions.
47
Shopping Assistance
Allow caregiver remote access to actor's **shopping** list.

Allow for **shopping** online by the actor or caregiver to alleviate stress or time associated with **shopping** .

Maintain a schedule for when to go **shopping** .

Maintain a basic **shopping** list and **track** when supplies are low.

Facilitate the development of a **shopping** list.

Alert caregiver or actor of **store** events, sales on merchandise, etc..

Pressure Sores
Provide reminders to use bathroom.

Monitor for urine...to change clothing, wash clothing and sheets if moisture 1 5 detected.

Monitor position and **movement** changes.
Provide reminders to change position and suggestions for new positions.

Using Equipment
E Omni...usage caps that monitor how often they are opened (this is done with certain drug **monitoring**) and record this information.

Provide sensors for cabinets. Since most people **store** their alcohol in one area, it can give a rough estimate of how often it...panel.

0 Suggest appropriate attire to the actor before the actor leaves the home.

Sleeping
Track sleeping habits.

Assess current sleeping habits against previous sleeping habits.

0 Assess sleeping habits based...

5/3,K/90 (Item 10 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01015136 **Image available**
IDENTIFYING CHANGED RECORDS IN A FILE STORED ON AN ELECTRONIC TOKEN
IDENTIFICATION D'ECRITURES MODIFIEES DANS UN FICHIER MEMORISE SUR UN JETON ELECTRONIQUE
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MCDONALD David, 380 Wilbrod Street, Ottawa, Ontario K1N 6M8, CA,
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200345089 A1 20030530 (WO 0345089)
Application: WO 2002CA1755 20021118 (PCT/WO CA0201755)
Priority Application: US 2001987828 20011116
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG
SI SK SL TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 5981

Fulltext Availability:
Detailed Description

Detailed Description
... 80 may be one of any
number of service provider servers that is adapted to
track information stored on the electronic token 10. A
few areas where such a system is...

...services; such as taxation, health care,
welfare, employment insurance and licenses; employee
location and productivity **monitoring** ; and personal
location **monitoring** . There are many service features
that may be applied in ...registering element 80 will likely include a
database 84
for individual users or subscribers to **store** information
related to the **subscriber** and the specific service or
monitoring functions of the registering element 80. The
records stored on the electronic token may contain...

...For example, drug
prescription records stored on a government health card,
or records related to **movement** within a facility stored
on a security access card.

For -any one of several reasons...
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T S5/9/77

5/9/77 (Item 2 from file: 275)
DIALOG(R)File 275:Gale Group Computer DB(TM)

02499900 SUPPLIER NUMBER: 73958995 (THIS IS THE FULL TEXT)
Behind BlueEyes.(Technology Information)
Tristram, Claire
Technology Review (Cambridge, Mass.), 104, 4, 32
May, 2001
ISSN: 1099-274X LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 347 LINE COUNT: 00030

TEXT:
SOFTWARE I Most of us hardly notice the surveillance cameras watching over the grocery store or the bank. But lately those lenses have been looking for far more than shoplifters.

Engineers at IBM's Almaden Research Center in San Jose, CA, report that a number of large retailers have implemented surveillance systems that

record and interpret **customer** movements, using software from Almaden's BlueEyes research project. BlueEyes is developing ways for computers to anticipate users' wants by gathering video data on eye **movement** and facial expression. Your gaze might rest on a Web site heading, for example, and that would prompt your computer to find similar links and to call them up in a new window. But the first practical use for the research turns out to be snooping on shoppers.

BlueEyes software makes sense of what the cameras see to answer key questions for retailers, including, How many shoppers ignored a promotion? How many stopped? How long did they stay? Did their faces register boredom or delight? How many reached for the item and put it in their **shopping** carts? BlueEyes works by **tracking** pupil, eyebrow and mouth **movement** . When **monitoring** pupils, the system uses a camera and two infrared light sources placed inside the product display. One light source is aligned with the camera's focus; the other is slightly off axis. When the eye looks into the camera-aligned light, the pupil appears bright to the sensor, and the software registers the **customer** 's attention.

BlueEyes has set off warning bells at the American Civil Liberties Union. "Soon you won't only be able to capture how many people stopped by, but who they were," says Barry Steinhardt, associate director of the ACLU." Once identity is established it will be cross-referenced to capture that person's income and buying preferences. It's only a matter of time." Not surprisingly, IBM's retail customers unanimously requested that the firm not reveal their names to the press, or the locations where BlueEyes has been implemented.

COMPANY NAMES: International Business Machines Corp. Almaden Research Center--Product development
DESCRIPTORS: Company technology development
PRODUCT/INDUSTRY NAMES: 3662671 (Communications Surveillance Systems)
SIC CODES: 3663 Radio & TV communications equipment
NAICS CODES: 334511 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
FILE SEGMENT: MI File 47
?

T S5/9/79

5/9/79 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01163447
Method and apparatus for determining if user walks away from a self-service checkout terminal during operation thereof
Verfahren und Vorrichtung zum Feststellen ob ein Selbstbedienungsabrechnungsterminal wahrend seines Betriebes von einem Kunden verlassen wird
Methode et dispositif pour determiner si un utilisateur quitte un terminal d'enregistrement de supermarche en self-service pendant l'operation de celui-ci
PATENT ASSIGNEE:
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LEGAL REPRESENTATIVE:
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PATENT (CC, No, Kind, Date): EP 1014319 A2 000628 (Basic)
APPLICATION (CC, No, Date): EP 99310288 991221;
PRIORITY (CC, No, Date): US 217542 981221
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: G07G-001/00; A47F-009/04; G07C-011/00

ABSTRACT EP 1014319 A2

A method of operating a self-service checkout terminal located in a checkout area of a retail store includes the step of generating a payment-tendered control signal when a user of the self-service checkout terminal tenders payment for a number of items for purchase. The method also includes the step of detecting movement of the user on a movement detection floor mat and generating a walk-away control signal if the user exits the checkout area of the retail store. Moreover, the method includes the step of generating a personnel-request control signal if the walk-away control signal is generated prior to generation of the payment-tendered control signal. A self-service checkout terminal is also disclosed.

ABSTRACT WORD COUNT: 113
NOTE:
Figure number on first page: 3

LEGAL STATUS (Type, Pub Date, Kind, Text):
Application: 000628 A2 Published application without search report
Change: 041208 A2 Legal representative(s) changed 20041019
LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200026	948
SPEC A	(English)	200026	5385
Total word count - document A			6333
Total word count - document B			0
Total word count - documents A + B			6333

SPECIFICATION The present invention relates generally to a self-service checkout terminal, and more particularly to a method and apparatus for determining if a user walks away from a self-service checkout terminal during operation thereof.

In the retail industry, the largest expenditures are typically the cost of the goods sold followed closely by the cost of labor expended. With particular regard to the retail grocery or supermarket industry, the impetus to reduce labor costs has focused on reducing or eliminating the amount of time required to handle and/or process the items or goods to be purchased by a customer. To this end, there have been a number of self-service checkout terminal concepts developed which attempt to substantially eliminate the need for a checkout clerk.

A self-service checkout terminal is a system which is operated by a customer without the aid of a checkout clerk. In such a system, the customer scans individual items for purchase across a scanner and then places the scanned item into a grocery bag, if desired. The customer then pays for his or her purchase either at the self-service checkout terminal if so equipped, or at a central payment area which is staffed by a store employee. Thus, a self-service checkout terminal permits a customer to select, itemize, and in some cases pay for his or her purchase without the assistance of the retailer's personnel.

A customer typically has little or no training in the operation of a self-service checkout terminal prior to his or her initial use of the

checkout terminal. One concern that retailers have when evaluating a self-service checkout terminal is the level of supervision provided to inexperienced customers. Moreover, it is also known that some customers may have improper intentions when using a self-service checkout terminal. In traditional checkout systems, the clerk employed by the retailer to operate the checkout terminal provides a level of security against theft or other improprieties. However, in the case of a self-service checkout terminal, the terminal itself must provide the necessary security.

One security concern which is particularly important to retailers is the situation in which a customer attempts to walk away from the self-service checkout terminal (presumably with a number of items) prior to tendering payment for his or her items for purchase. In traditional checkout systems, the clerk employed by the retailer to operate the checkout terminal monitors or otherwise ensures that the customer pays for his or her items for purchase prior to walking away from the checkout terminal. However, in the case of a self-service checkout terminal, the terminal itself must provide security against such "walk away" improprieties by the customer.

It should also be appreciated that in certain circumstances the customer is not attempting to commit an impropriety such as theft merely because he or she walked away from the checkout terminal prior to tendering payment for his or her items for purchase. For example, prior to tendering payment, the customer may realize that he or she forgot an item that he or she desired to purchase and may therefore return to the shopping area of the store to retrieve the item before completing the transaction. Moreover, during operation of the checkout terminal, the customer may walk away from the checkout terminal to have a conversation with a store employee, friend, or the like with the intent to return to the checkout terminal to complete his or her checkout transaction.

What is needed therefore is an apparatus and method for operating a self-service checkout terminal which overcomes one or more of the above-mentioned drawbacks. What is particularly needed is a method and apparatus for determining if a user walks away from a self-service checkout terminal during operation thereof with an intent to commit an impropriety such as theft.

In accordance with a first embodiment of the present invention, there is provided a method of operating a self-service checkout terminal located in a checkout area of a retail store. The method includes the step of generating a payment-tendered control signal when a user of the self-service checkout terminal tenders payment for a number of items for purchase. The method also includes the step of detecting if the user exits the checkout area of the retail store and generating a walk-away control signal in response thereto. Moreover, the method includes the step of generating a personnel-request control signal if the walk-away control signal is generated prior to generation of the payment-tendered control signal.

In accordance with a second embodiment of the present invention, there is provided a method of operating a self-service checkout terminal located in a checkout area of a retail store. The method includes the step of generating a payment-tendered control signal when a user of the self-service checkout terminal tenders payment for a number of items for purchase. The method also includes the step of detecting movement of the user on a movement detection floor mat and generating a walk-away control signal if the movement of the user is indicative of an attempt by the user to exit the checkout area of the retail store. Moreover, the method includes the step of generating a personnel-request control signal if the walk-away control signal is generated prior to generation of the payment-tendered control signal.

Preferably, the method further comprises the step of:

operating a summoning device so as to summon retail personnel in response to generation of said personnel-request control signal.

Preferably said detecting step includes the step of detecting movement of said user on said movement detection floor mat so as to determine if said user exits said checkout area of said retail store so as to return to a shopping area of said retail store and generating a return-to-shopping control signal in response thereto, further comprising the steps of:

detecting movement of said user on said movement detection floor mat so as to determine if said user returns to said checkout area of said retail store from said shopping area of said retail store and generating a return-to-terminal control signal in response thereto; and

operating said self-service checkout terminal so as to allow said user to continue a retail transaction in response to generation of said return-to-terminal control signal.

Preferably said step of detecting movement of said user on said movement detection floor mat so as to determine if said user exits said checkout area of said retail store so as to return to said shopping area of said retail store includes the step of detecting movement of said user on said movement detection floor mat in a direction toward said shopping area and generating said return-to-shopping control signal in response thereto.

Preferably said detecting step includes the step of detecting movement of said user on said movement detection floor mat so as to determine if said user exits said checkout area of said retail store so as to exit said retail store and generating an exiting-store control signal in response thereto, further comprising the steps of:

generating a personnel-needed-immediately control signal in response to generation of said exiting-store control signal; and

operating a summoning device so as to summon retail personnel in response to generation of said personnel-needed-immediately control signal.

Preferably said step of detecting movement of said user on said movement detection floor mat so as to determine if said user exits said checkout area of said retail store so as to exit said retail store includes the step of detecting movement of said user on said movement detection floor mat in a direction indicative of an attempt by said user to exit said retail store and generating said personnel-needed-immediately control signal in response thereto.

In accordance with a third embodiment of the present invention, there is provided a self-service checkout terminal. The terminal includes a movement detecting device for detecting movement of a user thereon. The terminal also includes a processing unit electrically coupled to the movement detecting device. Moreover, the terminal includes a memory device electrically coupled to the processing unit. The memory device has stored therein a plurality of instructions which, when executed by the processing unit, causes the processing unit to (a) generate a payment-tendered control signal when the user of the self-service checkout terminal tenders payment for a number of items for purchase, (b) detect if the user exits the checkout area of the retail store with the movement detecting device and generate a walk-away control signal in response thereto, and (c) generate a personnel-request control signal if the walk-away control signal is generated prior to generation of the payment-tendered control signal.

It is therefore an object of the present invention to provide a new and useful method of and apparatus for operating a self-service checkout terminal.

It is an advantage of the present invention to provide a method of and apparatus which enables a determination to be made if a user walks away from a self-service checkout terminal during operation thereof with an

intent to commit an impropriety such as theft.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of a self-service checkout terminal which incorporates features in accordance with the present invention therein;

FIG. 2 is a plan view of the self-service checkout terminal of FIG. 1;

FIG. 3 is a simplified block diagram of the self-service checkout terminal of FIG. 1;

FIG. 4 is a plan view of the self-service checkout terminal of FIG. 1 which illustrates movement of the customer within the checkout area of the store;

FIG. 5 is a view similar to FIG. 4, but illustrating movement of the customer from the checkout area of the store to the shopping area of the store; and

FIG. 6 is a view similar to FIG. 4, but illustrating movement of the customer from the checkout area of the store to the exit of the store.

Referring now to FIGS. 1 and 2, there is shown a retail terminal such as a self-service checkout terminal 10 for use in a retail business such as a grocery store. For purposes of the following discussion, the self-service checkout terminal 10 will be described in detail; however, it should be appreciated that numerous other types of retail terminals may also utilize the hereinafter described aspects of the present invention. For example, an automated teller machine (ATM) or an information terminal such as a kiosk may also be configured to utilize the hereinafter described aspects of the present invention.

The self-service checkout terminal 10 includes a summoning device such as a status light device 11, a product scale 12, a scanner 14, a bagwell scale 20, a movement detecting device such as a movement detection floor mat 22, a card reader 30, a display monitor 32, a keypad 34, a printer 36, and a processing unit 26. The card reader 30, the display monitor 32, the keypad 34, and the printer 36 may be provided as separate components, or alternatively may preferably be provided as components of an automated teller machine (ATM) 24.

The self-service checkout terminal 10 also includes a bagwell 38 for accommodating one or more grocery bags (not shown) and a base 40 having a counter 42 secured thereto. The counter 42 defines an arcuate surface as shown in FIG. 2. Such an arcuate surface allows the scanner 14 to be positioned relatively close or otherwise proximate the ATM 24 and hence the components associated therewith. Such a configuration facilitates a user's (e.g. customer's) use of the self-service checkout terminal 10. Moreover, the bagwell 38 is configured to allow two or more grocery bags to be accessed by the customer at any given time thereby allowing a customer to selectively load various item types into the grocery bags. For example, the customer may desire to use a first grocery bag for household chemical items such as soap or bleach, and a second grocery bag for edible items such as meat and produce.

The scanner 14 conventionally scans or reads a product identification code such as a Universal Product Code (UPC), industrial symbol(s), alphanumeric character(s), or other indicia associated with an item to be purchased. One scanner which may be used in the present invention is a model number 7875 bi-optic scanner which is commercially available from NCR Corporation of Dayton, Ohio.

The scanner 14 includes a first scanning window 14a and a second scanning window 14b. The first scanning window 14a is disposed in a substantially horizontal manner, whereas the second scanning window 14b is disposed in a substantially vertical manner, as shown in FIG. 1. The product scale 12 is integrated with the scanner 14. More specifically, the product scale 12 is disposed substantially parallel to the scanning window 14a thereby enveloping the scanning window 14a. If an item such as

produce is placed upon the product scale 12 or the first scanning window 14a, the product scale 12 may be used to determine the weight of the item.

The scanner 14 also includes a light source (not shown) such as a laser, a rotating mirror (not shown) driven by a motor (not shown), and a mirror array (not shown). In operation, a laser beam reflects off the rotating mirror and mirror array to produce a pattern of scanning light beams. As the product identification code on an item is passed over the scanner 14, the scanning light beams scatter off the code and are returned to the scanner 14 where they are collected and detected. The reflected light is then analyzed electronically in order to determine whether the reflected light contains a valid code pattern. If a valid code pattern is present, the product identification code may then be utilized to retrieve product information associated with the item (e.g. the price of the item) in the manner described below.

The display monitor 32 displays instructions which serve to guide a customer through a checkout procedure. For example, an instruction is displayed on the display monitor 32 which instructs the customer to enter an item into the self-service checkout terminal 10 by either passing the item over the scanner 14, or placing the item on the product scale 12 in order to obtain the weight of the item. The display monitor 32 is preferably a known touch screen monitor which can generate data signals when certain areas of the screen are touched by a customer.

The status light device 11 is provided in order to notify store personnel, such as a customer service manager, if intervention into the customer's transaction is needed. In particular, the status light device 11 may display a first colored (e.g. yellow) light in order to notify store personnel that intervention is needed prior to the end of the customer's transaction. Alternatively, the status light device 11 may display a second colored (e.g. red) light in order to notify store personnel that intervention is needed immediately.

The bagwell scale 20 is a weight scale which monitors the weight of items placed in the bagwell 38 (i.e. into a grocery bag) or onto the portion of the counter 42 which is located proximate the bagwell 38. It should be appreciated that a **customer** may place an item onto the portion of the counter 42 proximate the bagwell 38 subsequent to entering the item, but prior to placing the item into a grocery bag. For example, if a **customer** scans a loaf of bread, the **customer** may want to place the bread onto the portion of the counter 42 proximate the bagwell 38 until one of the grocery bags is nearly full thereby preventing the bread from being crushed. Hence, the bagwell scale 20 may be utilized to monitor the ingress and egress of items into and out of the bagwell 38 along with onto and off of the counter 42. Such **monitoring** is particularly useful for preventing items which have not been scanned from being placed into a grocery bag.

The movement detection floor mat 22 is provided to track movement of a **customer** within a checkout area 44 of the retail **store** . What is meant herein by the term "checkout area" is the area around the self-service checkout terminal 10 in which the **customer** moves about during operation of the terminal 10 to enter and bag items and thereafter tender payment for the same. For example, as shown in FIG. 2, the checkout area 44 may be defined as the area within the phantom lines around the self-service checkout terminal 10. As shall be discussed below in more detail, the movement detection floor mat 22 is capable of detecting directional movement of the **customer** within the checkout area 44. Such detection capability is distinguished from a simple motion sensor in that the **movement** detection floor mat 22 is capable of determining direction of travel along with **monitoring** **movement** throughout substantially all of the checkout area 44, not simply the area immediately in front of the terminal 10 as would be the case with a simple motion sensor.

The **movement** detection floor mat 22 is preferably constructed of a thin polypropylene laminate that is positioned on or under the carpeting or floor tiles of the **store** . The laminate is approximately 0.002 inches thick and includes tiny "pillows" of foamed plastic. These pillows function as an electret which is a type of electromagnet used, for example, in certain microphones. When a weak electrical current is applied across the top of the laminate, the foamed plastic pillows respond to slight or otherwise minute changes in pressure by generating an electrical output signal. Such **movement** detection floor mats 22 have been found to be able to detect the breathing of a person laying on the floor. One such **movement** detection floor mat which is suitable for use as the **movement** detection floor mat 22 of the present invention is commercially available from Messet Oy Company of Kuopio, Finland, certain aspects of which are disclosed in U.S. Patent No. 4,654,546, the disclosure of which is hereby incorporated by reference.

Hence, as shown in FIG. 2, the **movement** detection floor mat 22 may divided into a number of detection zones 22a-22l. Movement into an out of each of the detection zones 22a-22l may be utilized to **track** movement of a customer within the checkout area 44 of the store. In particular, the movement detection floor mat 22 generates ordered output signals indicative of which detection zone 22a-22l is being stepped on by the customer operating the self-service checkout terminal 10. It should be appreciated that the size, shape, and number of the detection zones 22a-221 may be altered to fit the needs of a given checkout area 44 or terminal 10. Moreover, it should be appreciated that a number of smaller, separate movement detection floor mats 22 may be utilized in lieu of a larger, single movement detection floor mats 22 divided into the detection zones 22a-221, if so desired.

Referring now to FIG. 3, there is shown a simplified block diagram of the self-service checkout terminal 10. The processing unit 26 is electrically coupled to the product scale 12, the scanner 14, the bagwell scale 20, the movement detection floor mat 22, the card reader 30, the display monitor 32, and the keypad 34. The processing unit 26 is also electrically coupled to a network 25 and a memory device 27.

The processing unit 26 monitors output signals generated by the scanner 14 via a communication line 29. In particular, when the customer scans an item which includes a product identification code across the scanning windows 14a, 14b, an output signal indicative of the product identification code is generated on the communication line 29.

The processing unit 26 is coupled to the product scale 12 via a data communication line 31. In particular, when a customer places an item on the product scale 12, the product scale 12 generates an output signal on the data communication line 31 indicative of the weight of the item.

The processing unit 26 is coupled to the bagwell scale 20 via a data communication line 52. In particular, when a customer places an item into a grocery bag or onto the portion of the counter 42 proximate the bagwell 38, the bagwell scale 20 generates an output signal on the data communication line 52 indicative of the weight of the items in the grocery bags and on the portion of the counter 42 proximate the bagwell 20.

The processing unit 26 communicates with the display monitor 32 through a data communication line 43. The processing unit 26 generates output signals on the data communication line 43 which cause various instructional messages to be displayed on the display monitor 32. As alluded to above, the display monitor 32 may include known touch screen technology which can generate output signals when the customer touches a particular area of the display screen associated with the display monitor 32. The signals generated by the display monitor 32 are transmitted to the processing unit 26 via the data communication line 43. It should be appreciated that the various instructional messages may also be

communicated via other devices in addition to or in lieu of the display monitor 32. For example, instructional messages may be generated with a voice generating device (not shown) or an audible tone generating device (not shown).

The keypad 34 is coupled to the processing unit 26 through a data communication line 49. The keypad 34 may include one or more of a known keypad or a touch pad. It should be appreciated that the touch screen associated with the display monitor 32 and the keypad 34 define input devices which may be utilized by a customer to input information associated with operation of the self-service checkout terminal 10.

Moreover, the card reader 30 is coupled to the processing unit through a data communication line 45. The card reader 30 may include a known credit, debit, loyalty, and/or smart card reader which is capable of reading information stored on the customer's card.

The movement detection floor mat 22 is coupled to the processing unit 26 via a data communication line 46. The movement detection floor mat 22 generates output signals on the data communication line 46 indicative of the customer's movement within the checkout area 44 of the retailer's store. It should be appreciated that the processing unit 26 receives such output signals from the movement detection floor mat 22 and determines a motion pattern associated with the customer's movement (i.e. in which direction the customer is walking and if the customer stays within the checkout area 44). For example, as shown in FIG. 4, if the customer moves between the scanner 14, the bagwell 38, and the ATM 24 during operation of the self-service checkout terminal 10, the movement detection floor mat 22 generates ordered output signals indicative of movement, for example, in the detection zones 22b, 22c, 22d, and 22e.

In addition, as shown in FIG. 5, if the customer walks away from the self-service checkout terminal 10 so as to return to a shopping area 48 of the retailer's store, the movement detection floor mat 22 generates ordered output signals indicative of movement, for example, in the detection zones 22e, 22f, 22k, 22d, 22i, 22b, and 22g. Subsequent to such movement detection, the movement detection floor mat 22 does not generate further output signals since the customer is not standing or otherwise positioned in the checkout area 44 (i.e. on the movement detection floor mat 22). What is meant herein by the term "shopping area" is the area of the retail store containing shelves and the like where the customer typically selects his or her items for purchase. Hence, during a typical visit to the retailer's store, the customer selects his or her items for purchase from the shopping area 48 of the store and thereafter advances to the checkout area 44 of the store so as to checkout his or her items for purchase with the self-service checkout terminal 10.

Moreover, as shown in FIG. 6, if the customer walks away from the self-service checkout terminal 10 so as to exit the store through a store exit 50, the movement detection floor mat 22 generates ordered output signals indicative of movement, for example, in the detection zones 22a, 22b, 22h, 22c, 22j, 22e, and 22l. Subsequent to such movement detection, the movement detection floor mat 22 does not generate further output signals since the customer is not standing or otherwise positioned in the checkout area 44 (i.e. on the movement detection floor mat 22). It should be appreciated that such movement toward the store exit 50 is typically performed only after the customer has tendered payment for his or her items for purchase. In particular, as discussed below in greater detail, if the customer makes an attempt to exit the retail store prior to tendering payment for his or her items for purchase, the processing unit 26 concludes that the customer may be attempting to commit an impropriety such as theft.

The processing unit 26 includes network interface circuitry (not shown) which conventionally permits the self-service checkout terminal 10 to communicate with the retailer's network 25 such as a LAN or WAN through a

wired connection 51. The processing unit 26 communicates with the retailer's network 25 during the checkout procedure in order to obtain information, such as pricing information, associated with an item being scanned or otherwise entered, and also to verify customer credit approval when appropriate. The network interface circuitry associated with the self-service checkout terminal 10 may include a known Ethernet expansion card, and the wired connection 51 may include a known twisted-pair communication line. Alternatively, the network interface circuitry may support wireless communications with the retailer's network 25.

The processing unit 26 communicates with the memory device 27 via a data communication line 53. The memory device 27 is provided to maintain an electronic transaction table which includes a record of the product information associated with each item that is scanned, weighed, or otherwise entered during the customer's use of the self-service checkout terminal 10. For example, if the customer scans a can of soup, the description of the soup and the pricing information associated therewith is recorded in the transaction table in the memory device 27. Similarly, if the customer weighs a watermelon with the product scale 12 and then enters a product lookup code associated with watermelon via the data input device 34, product information associated with the watermelon is recorded in the transaction table.

It should therefore be appreciated that the sum of each of the items recorded in the transaction table (1) minus any reductions (e.g. coupons), and (2) plus any applicable taxes is the amount that the customer pays for his or her transaction. Moreover, data stored in the transaction table is printed out on the printer 36 thereby generating a receipt for the customer at the end of his or her transaction.

In operation, after the customer has selected his or her items for purchase from the shopping area 48 of the retailer's store, the customer advances to the checkout area 44 of the store so as to checkout his or her items for purchase with the self-service checkout terminal 10. The customer then initializes the self-service checkout terminal 10 and commences to scan his or her items for purchase with the scanner 14 or otherwise enter his or her items into the terminal 10. Once the customer has entered the last of his or her items for purchase, the processing unit 26 causes a message to be displayed in the display monitor 32 which instructs the customer to tender payment for his or her items for purchase by either inserting cash into a currency acceptor (not shown) or by inserting a debit, credit, or smart card into the card reader 30. It should be appreciated that in the case of when the customer inserts cash into the currency acceptor, change may be returned to the customer by a currency dispenser (not shown) and a coin dispenser (not shown). If the customer properly tenders payment for his or her items for purchase, a payment-tendered control signal is generated thereby causing the retail checkout transaction to end.

During such a retail checkout transaction, the movement detection floor mat 22 is utilized to monitor the customer's movement both within and into and out of the checkout area 44. If the customer exits the checkout area 44 of the retail store, the processing unit 26 generates a walk-away control signal which is utilized to determine if the customer is attempting to commit an impropriety such as theft. In particular, if the customer walks away from (i.e. exits) the checkout area 44 of the store prior to tendering payment for his or her items for purchase (i.e. the walk-away control signal is generated prior to generation of the payment-tendered control signal), the processing unit 26 generates a personnel-request control signal. In response to generation of the personnel-request control signal, the processing unit 26 operates a summoning device (e.g. the status light device 11 or a paging system) so as to summon retail personnel such as the customer service manager to investigate the walk away situation. It should be appreciated that, as

described below, certain walk away situations are deemed less of a security risk relative to other walk away situations.

For example, as shown in FIG. 5, if the customer walks away from the self-service checkout terminal 10 so as to return to the shopping area 48 of the retailer's store, the movement detection floor mat 22 generates ordered output signals indicative of movement, for example, in the detection zones 22e, 22f, 22k, 22d, 22i, 22b, and 22g. Receipt of such ordered output signals causes the processing unit 26 to generate a first type of walk-away control signal such as a return-to-shopping control signal. If the customer then later returns to the shopping area 44 (i.e. the movement detection floor mat 22 detects presence of the customer), a return-to-terminal control signal is generated. Upon generation of the return-to-terminal control signal, the processing unit 26 concludes that the customer was not attempting to commit an impropriety such as theft and therefore causes the self-service checkout terminal 10 to be operated so as to allow the customer to continue his or her retail checkout transaction. More particularly, since the customer exited the checkout area 44 so as to return to the shopping area 48 of the store and thereafter returned to the checkout area 44, the processing unit 26 concludes that the customer merely returned to the shopping area 48 to retrieve a forgotten item. It should be appreciated that if the customer does not return to the checkout area 44 within a predetermined period of time the processing unit 26 may operate the status light device 11 so as to summon retail personnel such that retail personnel may void the abandoned retail checkout transaction.

However, as shown in FIG. 6, if the customer walks away from the self-service checkout terminal 10 so as to exit the store through the store exit 50, the movement detection floor mat 22 generates ordered output signals indicative of movement, for example, in the detection zones 22a, 22b, 22h, 22c, 22j, 22e, and 22l. Receipt of such ordered output signals causes the processing unit 26 to generate a second type of walk-away control signal such as an exiting-store control signal. If the customer exits the checkout area 44 in a direction indicative of an attempt to exit the store prior to tendering payment for his or her items for purchase (i.e. the exiting-store control signal is generated prior to generation of the payment-tendered control signal), a personnel-needed-immediately control signal is generated. Upon generation of the personnel-needed-immediately control signal, the processing unit 26 concludes that the customer may be attempting to commit an impropriety such as theft and therefore operates the summoning device (e.g. the status light device 11 or a paging system) to summon retail personnel in an urgent manner. For example, the status light device 11 may be operated to flash a red signal lamp so as to alert retail personnel that the customer may be exiting the store with items which have not been paid for. Retail personnel may then investigate the customer's transaction in order to determine if the customer was attempting to commit an impropriety such as theft.

While the invention has been illustrated and described in detail in the drawings and foregoing description, such an illustration and description is to be considered as exemplary and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the scope of the invention are desired to be protected.

For example, the processing unit 26 may also monitor the rate of movement that the customer exits the checkout area 44. For example, if the customer quickly exits the checkout area 44 in a direction toward the store exit 50 without having first tendered payment for his or her items for purchase, the processing unit 26 may conclude that the customer is running out of the store with items which have not been paid for and therefore generate an alarm to alert retail personnel to the situation.

Moreover, the movement detection floor mat 22 may also be utilized to monitor additional movements other than the movement associated with the user of the self-service checkout terminal 10.. For example, the movement detection floor mat 22 may monitor movement of a shopping cart or the like or a person accompanying the user of the terminal 10 (e.g. a child).

CLAIMS 1. A method of operating a self-service checkout terminal located in a checkout area of a retail store, comprising the steps of:
generating a payment-tendered control signal when a user of said self-service checkout terminal tenders payment for a number of items for purchase;
detecting if said user exits said checkout area of said retail store and generating a walk-away control signal in response thereto; and
generating a personnel-request control signal if said walk-away control signal is generated prior to generation of said payment-tendered control signal.

2. A method as claimed in claim 1, comprising the step of:

operating a summoning device so as to summon retail personnel in response to the generation of said personnel-request control signal.

3. A method as claimed in claim 1 or claim 2, wherein said step of detecting if said user exits said checkout area of said retail store includes the step of detecting movement of said user on a movement detection floor mat and generating said walk-away control signal if said movement of said user is indicative of an attempt by said user to exit said checkout area of said retail store.

4. A method as claimed in any preceding claim, wherein said detecting step includes the step of detecting if said user exits said checkout area of said retail store so as to return to a shopping area of said retail store and generating a return-to-shopping control signal in response thereto, further comprising the steps of:
detecting if said user returns to said checkout area of said retail store from said shopping area of said retail store and generating a return-to-terminal control signal in response thereto; and
operating said self-service checkout terminal so as to allow said user to continue a retail transaction in response to generation of said return-to-terminal control signal.

5. A method as claimed in claim 4, wherein said step of detecting if said user exits said checkout area of said retail store so as to return to said shopping area of said retail store includes the step of detecting movement of said user on a movement detection floor mat in a direction toward said shopping area and generating said return-to-shopping control signal in response thereto.

6. A method as claimed in any preceding claim, wherein said detecting step includes the step of detecting if said user exits said checkout area of said retail store so as to exit said retail store and generating an exiting-store control signal in response thereto, further comprising the steps of:
generating a personnel-needed-immediately control signal in response to generation of said exiting-store control signal; and
operating a summoning device so as to summon retail personnel in response to generation of said personnel-needed-immediately control signal.

7. A method as claimed in claim 6, wherein, said step of detecting if said user exits said checkout area of said retail store so as to exit said retail store includes the step of detecting movement of said user on a movement detection floor mat in a direction indicative of an attempt by said user to exit said retail store and generating said personnel-needed-immediately control signal in response thereto.

8. A self-service checkout terminal, comprising:
a movement detecting device for detecting movement of a user thereon;
a processing unit electrically coupled to said movement detecting device; and
a memory device electrically coupled to said processing unit, wherein said memory device has stored therein a plurality of instructions which, when executed by said processing unit, causes said processing unit to:
(a) generate a payment-tendered control signal when said user of said self-service checkout terminal tenders payment for a number of items for purchase,
(b) detect if said user exits said checkout area of said retail store with said movement detecting device and generate a walk-away control signal in response thereto, and
(c) generate a personnel-request control signal if said walk-away control signal is generated prior to generation of said payment-tendered control signal.

9. A terminal as claimed in claim 8, comprising a summoning device for summoning retail personnel, wherein said plurality of instructions, when executed by said processing unit, further causes said processing unit to operate said summoning device so as to summon said retail personnel in response to generation of said personnel-request control signal.

10. A terminal as claimed in claim 8 or claim 9, wherein:
said movement detecting device includes a movement detection floor mat, and
said plurality of instructions, when executed by said processing unit, further causes said processing unit to detect movement of said user on said movement detection floor mat and generate said walk-away control signal in response thereto.

11. A terminal as claimed in claim 10, wherein said plurality of instructions, when executed by said processing unit, further causes said processing unit to:
(a) detect if said user exits said checkout area of said retail store so as to return to a shopping area of said retail store with said movement detection floor mat and generate a return-to-shopping control signal in response thereto,
(b) detect if said user returns to said checkout area of said retail store from said shopping area of said retail store with said movement detection floor mat and generate a return-to-terminal control signal in response thereto, and
(c) operate said self-service checkout terminal so as to allow said user to continue a retail transaction in response to generation of said return-to-terminal control signal.

12. A terminal as claimed in claim 10 or claim 11, comprising a summoning device for summoning retail personnel, wherein said plurality of instructions, when executed by said processing unit, further causes said processing unit to:
(a) detect if said user exits said checkout area of said retail store so as to exit said retail store with said movement detection floor mat and generate an exiting-store control signal in response thereto,
(b) generate a personnel-needed-immediately control signal in response to generation of said exiting-store control signal, and
(c) operate said summoning device so as to summon retail personnel in response to generation of said personnel-needed-immediately control signal.

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5/3,K/91 (Item 11 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00986971 **Image available**
PRODUCT IDENTITY PRESERVATION AND TRACING
PRESERVATION ET SUIVI DE L'IDENTITE DES PRODUITS
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200317027 A2-A3 20030227 (WO 0317027)
Application: WO 2001US31512 20011009 (PCT/WO US0131512)
Priority Application: US 2001927920 20010810
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK
SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 10908

Fulltext Availability:
Detailed Description
Claims

English Abstract
...conventionally grown version that are difficult to differentiate between. A system (10) is described that **tracks** lots of these products form their creation through the entire storage and transportation process, which...

Detailed Description
... TECHNICAL FIELD
The invention generally relates to product handling and, more specifically, to the movement, **tracking** and storage of products.

BACKGROUND
In general, producers typically create products, store them in a... tracing
product origins and attributes. In particular, a system facilitator establishes a network-based lot **tracking** system that is accessible by each of the participants along the supply chain of a...a particular product. In addition, the participant provides any required certification documentation to the lot **tracking** system. The participant may

electronically transfer a certification document or a copy thereof to the ...

...a given quantity of a product, or lot, is uniquely identified from creation. The system **tracks** the lot as it moves along the supply chain and monitors other products with which the lot may be commingled. Furthermore, the lot **tracking** system ...throughout the supply chain. Thus, the product
3
identity preservation and tracing system facilitates the **tracking** of products from their creation until their eventual distribution while providing infort-nation about the...status. The method further includes storing the received information in a database and providing a **tracking** interface for **tracking** a lot based on the information in the database.

In other embodiments, the invention is...

...methods.

In another embodiment, the invention includes a system comprising a database to store movement **tracking** information relating to a unique identification
4
of a lot, a location of the lot, and timing information. The system also includes a web server to generate a **tracking** screen for tracing the movement and storage of the lot based on the database and...diagram illustrating a network communication system that facilitates communication and commercial transactions through a lot **tracking** system.
FIG. 2 is a block diagram illustrating an example lot **tracking** system for **tracking** the production and shipment of product that may be commingled.

FIG. 3 is a flowchart illustrating the basic operation of a lot **tracking** system consistent with the principals of the present invention.

FIG. 4 is a block diagram illustrating the production, transportation and storage of a product that is **tracked** by a lot **tracking** system.

FIG. 5 is a flow chart illustrating an example operation of a lot **tracking** system consistent with the principals of the invention.

FIG. 6 is a flowchart illustrating an...test or audit.

FIG. 10 is a schematic representation of a database table used to **track** the movements of identified lots.

FIG. I I is a schematic illustration of a lot identification database table.

FIGS. 12-23 illustrate exemplary interfaces for accessing and utilizing the **tracking** system of the invention.

5
FIG. 24 is a block diagram that illustrates a programmable...and commercial transactions between various parties, generally referred to as participants 4, and a lot **tracking** system IO.

Participants 4 include producers 6 that grow or create various products and intermediaries...

...Other participants 4 include internal or external business entities 13 that are linked with lot **tracking** system IO. Business entities 13 may be accounting departments or other data handling entities that are associated with a business controlling lot **tracking** system IO or associated with one of the other participants 4. For example, an accounting department could automatically provide data to lot **tracking** system 1 0 dealing with the movement or disposition of various products.

Customers 12 utilize...

...14, such as a computer, telephone, PDA, or other suitable electronic device, to access lot **tracking** system 10 through a network 16, such as the Internet, via a communications link 22.

Customer 12 accesses lot **tracking** system 10 and creates a "program" that specifies processes that should be followed in creating, transporting and storing the product.

Producer 4 accesses lot **tracking** system 10 via remote device 14, reviews the program offered by customer 12 and accepts...

...lot is moved and stored in a location, producer 4 or intermediary 8 accesses lot **tracking** system IO and updates move data relating to the lot. In addition, the program ...may require that producer 4 or intermediary 8 provide particular certification documents 18 to lot **tracking** system I 0, either by transferring an electronic document to lot **tracking** system 10 or indicating that a certification document has been generated.

6
Customer 12 can access lot **tracking** system 1 0 and trace a given lot through the supply chain. Lot **tracking** system IO determines each storage and transportation location the lot has been in and determines what, if any, other products were commingled. with the lot. Lot **tracking** system 1 0 provides a trace report 20 that details the history of ... may be generated by or displayed on remote device 14 with data provided by lot **tracking** system 1 0.

As indicated above, a lot is a quantity of a product moved or stored together. Lot **tracking** system 1 0 creates lot identification numbers, codes or other identifiers to identify specific lots. Lot **tracking** system IO can use various I 0 schemas in defining the creation of a lot. For example, lot **tracking** system IO generates (or is provided with) a lot identifier when the lot is initially formed.

Thus, lot **tracking** system 1 0 can **track** and record each lot number so created throughout the entire process. Alternatively, each time two or more lots are stored or moved together, lot **tracking** system 1 0 generates a new lot identifier. As various lots are commingled, lot **tracking** system 10 can easily and succinctly **track** the contents. Of course, all of the information is retained and can be accessed. For example, assuming lot "I 0" comprises lots "4, 5, and 6", lot **tracking** system 1 0 can determine the contents of lot "IO" by recalling information pertaining to...of identifiers for commingled lots.

FIG. 2 is a block diagram illustrating an example lot **tracking** system 1 0 for
tracking and tracing the production and shipment of product that may be commingled. In particular, lot **tracking** system 1 0 includes a software

platform 24 that is in communication with a databasean audit, certification and testing module 34 ("audit module 34"), a lot **tracking** module 36 and a contract management module 38. Database26,whichisinconunu nicationwitheachofthemodules3O-38, includes a contract database...

...48, and a lot identification database 49.

7

A system facilitator establishes and maintains lot **tracking** system 1 0. The system facilitator accesses administrative module 30 to monitor and modify lot **tracking** system I 0, including assigning rights and security levels to participants 4.

Customer 12 utilizes...and are stored in program database 42. Customer 12 (or other interested parties) -utilizes lot **tracking** module 36 to trace and/or recall a lot based on infonnation in move database...Thus, there are a number of ways for participants 4 to enter information into lot **tracking** system 1 0 through audit module 34. For example, producers 6 and intermediaries 8 supply...other disposition. Finally, various testing facilities may supply test results and other data to lot **tracking** system 1 0 through audit module 34.

FIG. 3 is a flowchart illustrating the basic operation of lot **tracking** system 10. Referring to FIGS. 2 and 3. lot **tracking** system 10 receives program data (50) from customer 12. For example, customer 12 may want...and intermediary 9 must follow and may also indicate which certifications must be provided.

Lot **tracking** system 1 0 then receives (52) an acceptance of the program by producer 6 and...

...management module 38.

Producer 6 stores and/or moves lots of the product and lot **tracking** system 1 0 receives data (54) identifying the lot, the ...nation in move database 44. Ultimately, the product is delivered to customer 12 and lot **tracking** system 1 0 receives data indicating delivery to customer 12 (50). If the received move data indicates 1 0 handling by producer 6 or intennediary 8, lot **tracking** system 1 0 will again receive move data (54). At any point, customer 12 can access lot **tracking** system IO and detertnine a lot's history (58). Customer 12 can, for example, identify lot in question.

By way of example, FIG. 4 illustrates operation of lot **tracking** system IO during the production of one or more commodities, the transportation of those commodities...the fertilizers used, adjacent crops, and the like. Producer 6A enters this information through lot **tracking** module 36 (FIG. 2) and the information is stored in lot identification database 49.

Producers...bin 64C prior to the introduction of crop C and provides this information to lot **tracking** system IO through lot **tracking** module 3 6.

If two different lots of two different crops (e.g., high protein... levels) mix together during storage or transport, a new lot is effectively created and lot **tracking** system 1 0 **tracks** both the new combination and the original lots with a single lot identifier. Thus,

each time a lot moves, certain information should be retained and provided to lot **tracking** system IO. For example, the condition of the storage location or transportation device should be the nature of the previously stored lots or lot **tracking** system 1 0 automatically identifies the previously stored lots from data stored in move database ...74 and 76 as new lots are received. Intermediaries 8 provide this information to lot **tracking** system 1 0.

I 5 At some point, the elevator operators transport all or part... transportation devices 86. Each time a lot is moved, participant 4 provides information to lot **tracking** system I 0 indicating whether the location the lot is being moved to is clean...

...lots were there since that location's last reported clean and empty status. Alternatively, lot **tracking** system 1 0 can determine which lots ...were there previously based on information retained in database 24.

Customer 12 can access lot **tracking** system 10 to obtain information about the histories of the received lots. In addition, customer...

...other products that are sold to consumers, and could also utilize the I 0 lot **tracking** system for further processed products and consumer goods.

Consumers could also access lot **tracking** system 10 to determine the history of a given product. For example, a given box product. The consumer could access lot **tracking** system 1 0 and determine the nature of the grain used.

FIG. 5 is a flow chart illustrating an example operation of lot **tracking**

system 10. Referring to FIGS. 1, 2 and 5, customer 12 accesses (90) lot **tracking** system 1 0 through remote device 14 and accesses program configuration module 32 to define...parameter. Customer 12 may set forth the parameters in checklists that are available through lot **tracking** system I 0. For example, customer 12 may define a program that requires producer 6This may also be accomplished automatically via other aspects of lot **tracking** system 1 0. Furthermore, customer 12 may require producer 6 or intermediary 8 to prepare, sign, scan and/or transmit a specific document to lot **tracking** system 10 in order to fully comply with the certification requirement. Once created, the
1 2
program is stored (95) in lot **tracking** system I 0 and is accessible by various producers 6 who may be able to fill the order.

Producer 6 accesses (96) lot **tracking** system 10 through contract management module 3 8 and views (97) the programs generated by ... automatically if producer 6 and customer 12 have provided sufficient information and have authorized lot **tracking** 1 0 system 1 0 to generate the contract.

When defining the program, customer 12...6 to generate a contract for 15,000 tons. Furthermore, customer 12 can access lot **tracking** system 1 0 though contract management module 3 8 and determine how much of the...

...to the agreed
upon tenns. If required, producer 6 provides certifications (1 02) to lot **tracking** system 1 0. For example, producer 6 might certify that a specific seed was utilized to the lot **tracking** system IO, either in the form of an electronic or digital document, or simply indicates...

...and identifies the particular storage location (I 06) and corresponding condition (I 08) to lot **tracking** system 1 0.

13
Producer 6 then delivers the product (1 1 0) to intermediary...

...producer 6 identifies the transportation device (I 12) and its condition (I 14) to lot **tracking** system ...the identification and condition of each transportation device or storage location being delivered to lot **tracking** system 1 0 along with an identification of the particular lot.

The indication of the...operation of identifying the condition of a storage location or transportation device (120) to lot **tracking** system 10. Participant4communicateswithlottrackingsystem10andidentifiesa particular lot. The communication is time and date coded (1 22) or...

...storage location or transportation device and determines its condition and reports the condition to lot **tracking** system 1 0. More specifically, participant 4 indicates whether the storage location or transportation device...are already present (128) in the storage location and this information is provided to lot **tracking** system 10 (130).

Alternatively, participant 4 may ...provide an indication that the storage location or transportation device is not clean and lot **tracking** system 10 determines from move database 44 which other products are present. Likewise, if the...

...location or transportation device is clean and empty, this information is provided to
14
lot **tracking** system 10 (132). As another alternative, the clean and empty status can be made in...participant 4 is required to provide.

One advantage of the invention is the ability to **track** a lot and determine its history over a potentially complex transportation and storage process. That is, by accessing lot **tracking** system 1 0 participant 4 can determine what a given lot has been stored and...of an example lot tracing process. Participant 4, and most commonly customer 12, accesses lot **tracking** system 10 through lot **tracking** module 36 and requests the tracing of a lot (148). Participant 4 provides an identification...words, there are various ways to identify a given lot of a product to lot **tracking** system IO. Once a given lot is identified (1 50), lot **tracking** system IO accesses (1 52) move database 44 and identifies the origin of the searched lot (1 54). Lot **tracking** system 1 0 identifies all other lots that have ...lot. In this 0 example, a product has been commingled with the traced lot in **Track** 2. The commingled product was produced by "John Doe" on his field "8002" from seed...store the sample or send it to a central repository maintained in conjunction with lot **tracking** system 10. Section 190 also indicates that an additional "555,000" bushels were taken from...to customer 12. FIG. 9 is a flow chart illustrating an example operation of lot **tracking**

system I 0 when generating a test or audit (200). Such a test or audit... characteristics and stores the sample (206). The testing facility provides the results (208) to lot **tracking** system 10 as well as any interested party.

If the sampled lot is still moving...

...it is allowed to continue (21 0), any required certifications are generated (212), and lot **tracking** system I 0 appropriately updates (214) the information. Participants 4 provide an indication that ... testing, and provide either an indication of the certification or the actual certification to lot **tracking** system 1 0.

Independent third parties observe the locations and/or procedures of various participants...

...those actions through audit module 34.

If the test results are unacceptable (208), then lot **tracking** system 10 traces the lot (216) to detennine (218) which other lots have been affected by the unacceptable lot. If appropriate, lot **tracking** system 1 0 recalls the contaminated lots (220) or provides an indication of their condition. Lot **tracking** system 1 0 again updates the information (222).

FIG. 1 0 is a schematic representation of a database table 23 0 used to **track** the movements of identified lots. Lot **tracking** system 1 0 can use various methodologies to **track** lots, their status, and an identification of commingled products. By way of example, database table of any other lot(s) are already present or subsequently added, lot **tracking** system 1 0 can determine a complete history.

1 7

Database table 230 includes an...

...a location origin entry 236, and a location destination entry 243. From this information, lot **tracking** system 1 0 can generate a lot history based on the entries of database table...lot entry 250, a farm identification entry 252, and a field identification entry 254.

Lot **tracking** system 1 0 **tracks** a variety of grown products that may be commingled through storage and transportation. Furthermore, lot **tracking** system 1 0 can also **track** the products even after they have been processed or otherwise transformed. For example, lot **tracking** system 1 0 **tracks** lots of soybeans as they are moved, stored and potentially commingled. After receiving a lot...

...The soybean meal or soy milk is then distributed through commerce, but can still be **tracked** in the same way by lot **tracking** system 1 0 so that interested parties can ascertain the composition of the products received.

In one embodiment, lot **tracking** system 1 0 is implemented on one or more servers hosting HTML (hypertext markup language...

...which producers 6, intermediaries 8, customers 12, consumers or any other participants 4 access lot **tracking** system 1 0 and either obtain or provide information. FIG. 12 illustrates an example interface... customers 12 i.e., program managers, have access to interface 260. Other users access lot **tracking** system 1 0 through other interfaces

1 8

(not illustrated) that are appropriate for a...participants 4. Programs link 272 allows customer 12 to create and define specific programs for **tracking** lots. As explained above, the program defines the specific

parameters that ...modify sample information and requirements.

FIG. 13 illustrates an example interface 280 displayed by lot **tracking** system 10 when a participant 4 selects location link 268 of FIG. 12. Participant 4...relevant program, the time stamp, the status (i.e., clean/ empty) of the destination, and **tracking** information. The origin and destination are indicated at 306whiletheresultsofanytestingdonearedisplayedat3O8. Interface302 simply provides information, while example...reporting can be done in other formats. In addition, many of the features of lot **tracking** system 1 0 described herein will have additional screens that have not been illustrated herein...bus 418 via input/output ports 428. Other types of pointing devices (not shown) include **track** pads, **track** balls, joysticks, data gloves, head **trackers** , and other devices suitable for positioning a cursor on the video display 424.

System 400...are within the scope of the following claims. That is, the invention can monitor and **track** the status of a variety of products through a chain of commerce, and is not limited to agricultural commodities. Thus, the product identity preservation and tracing system facilitates the **tracking** of products from their creation until their eventual distribution while providing information about the products...

Claim
... 24
. The method of claim 1, further comprising presenting an interface to define programs for **tracking** a given lot.

9 The method of claim 8, ftirther comprising presenting an interface for ...claim 17 further comprising providing an interface for allowing the customer to define programs for **tracking** a ...a clean and empty
status;
storing the received information in a database; and
displaying a **tracking** interface for **tracking** a lot based on the information in the database.

37 The method of claim 36...of claim 36 further comprising providing an interface for a customer to define programs for **tracking** a given lot.
29
. The method of claim 45 further comprising providing an interface for... lots commingled with the identified lot.

62 A system comprising:
a database to store movement **tracking** information relating to a unique 1 0 identification of a lot, a location of the lot, and timing information;
and
a web server to generate a **tracking** screen for tracing the movement and storage of the lot based on the database and to allow a customer to define a
program for **tracking** the lot.

64 The system of claim 63, wherein the program provides a checklist for ...

...lot.

65 The system of claim 63, further comprising a contract module that allows

the **customer** to generate a contract with a producer for a quantity of a product defining the...

...maximum order.

67 The system of claim 63, wherein the program configuration module allows the **customer** to define certification ...of claim 62, wherein the system is in communication with a
business entity and receives **movement** **tracking** information from the business ...entity.

71 The system of claim 62, ftuther comprising a contract module for facilitating and **monitoring** contracts wherein the contract module prevents the generation of a contract in excess of a...

...62, further comprising an audit, certification and testing module configured to allow storage facilities that **store** the lot to identify a specific storage location, a time the lot enters the storage ...

...a clean and empty status of the storage location.

73 A method comprising:
receiving product **movement** information including a location status and a
time stamp;
storing the product **movement** information in a database; and
generating a report identifying each product location and any other products commingled with the product.
33
. The method of claim 73, wherein the product **movement** inforination includes a unique product identifier that includes a designation of a'farm, a field...

...information including a location, a
1 0 location status, and a time; and
a lot **tracking** module to generate a **tracking** information for the product
based on the product movement information stored in the database.

77...

...to receive the product movement inforination.

78 The system of claim 76, wherein the lot **tracking** module identifies commingled products based on the product movement infori-nation.

79 The system of...

5/3,K/92 (Item 12 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00951843 **Image available**
TROLLEY SECURITY WHEEL AND SYSTEM
ROUE ET SYSTEME DE SECURITE DE CHARIOT
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Patent and Priority Information (Country, Number, Date):
Patent: WO 200285684 A1 20021031 (WO 0285684)
Application: WO 2002GB1838 20020422 (PCT/WO GB0201838)
Priority Application: GB 20019912 20010423
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VN YU ZA ZM ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 3902

Fulltext Availability:
Detailed Description
Claims

Detailed Description
... brake is activated as soon as the trolley enters an unauthorised area. This prevents wheeled **movement** of the trolley an therefore discourages further **movement** of the trolley.

US-A-5,598,144 discloses a braking ...a trolley. The targets are for reflecting a signal back to a signal-detecting device. **shopping** trolleys by 'a reward mechanism which awards points/credits to a **customer** 's loyalty or reward card as and when a trolley is returned to a predetermined location. The invention includes a processing circuit which is capable of providing a **customer** -identification code in association with return of the trolley.

WO 02/085684 PCT/GB02/01838
4
provided with an identifier. Readers for reading identification tags are distributed around the **store** and allow **monitoring** of the location of individual trolleys and the provision of marketing data and **monitoring** of theft.

US 5,881,846 concerns a castor wheel with an external braking member... signal generator, and wherein remote
identification signal reading and logging means are provided, thereby permitting **tracking** of the movement of individual trolleys. Preferably, the
unique signal identification generator is provided'in trolley movement past cable locations.

This allows for the - **tracking** of the movement of trolleys through a store by the placing of suitable remote logging the data processor with reference to its identifier. This makes it much easier to **track**

servicing and repair of trolleys, which is, usually carried out by an outside agency and...

Claim
... generator, and wherein remote identification signal reading and logging means are provided, thereby perrn@itting' **tracking** , of the movement of individual trolleys.

17 A system as claimed,in claim 16 wherein...

5/3,K/93 (Item 13 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00951469 **Image available**
BODY WEIGHT MANAGEMENT SYSTEM
SYSTEME DE REGULATION DU POIDS CORPOREL
Patent Applicant/Assignee:
THE PROCTER & GAMBLE COMPANY, One Procter & Gamble Plaza, Cincinnati, OH 45202, US, US (Residence), US (Nationality)
Inventor(s):
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Legal Representative:
REED T David (et al) (agent), The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200285140 A2-A3 20021031 (WO 0285140)
Application: WO 2002US12312 20020419 (PCT/WO US0212312)
Priority Application: US 2001839740 20010420
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT (utility model) AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ (utility model) CZ DE (utility model) DE DK (utility model) DK DM DZ EC EE (utility model) EE ES FI (utility model) FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK (utility model) SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 9530

Fulltext Availability:
Detailed Description
Claims

English Abstract
...activity is greater than the calories consumed by that user. These devices include a diet- **tracking** system, devices for estimating energy expenditure of the subject and a satiety agent. Such systems...

Detailed Description
... body weight management systems for subjects including humans and domestic animals. Such systems utilize diet- **tracking** systems, devices to measure energy output and compositions comprising satiety agents. Such

systems are used...for specified physical activities including, but not necessarily limited to various exercises; data from diet- **tracking** system; data from activity monitoring device, calorimeter and any other data ...quantitatively using non-electronic
3
means , software, or web based means, or review of diet **tracking** and energy expenditure logs and, or records and mixtures thereof.

weight manager"
Any person, device...like Weight Watchers@, Jenny Craig@, and hospital supervised programs that are designed to help consumers **track** energy intake and energy output through a variety of techniques and devices. While many of...management system for self-management of said subject's body weight comprises a
5
diet- **tracking** system for estimating the subject's individual energy intake or caloric intake over a set...loops through the subject's computing device.

Detailed Description of the Invention
1 5 Diet- **Tracking** System
The caloric intake by the consumer is determined by diet- **tracking** systems. These systems can be manual **tracking** systems wherein the user maintains a log of the foods consumed over a set period...daily consumed and yetto-be consumed foods for a particular day.

Alternative approaches for diet **tracking** comes by way of electronic systems involving computer **tracking** software loaded onto a computing system. An example of software useful in the present invention...102 transfers body weight management system tools to subject 101. These tools include a diet- **tracking** system containing a database 103 in the form of a journal to record consurnables such...device 110 is employed. The hand held programmable device 110 is used wherein the diet- **tracking** system tool is in the form ...1 wherein a computing device is used, The computing device is used wherein the diet- **tracking** system tool is in the form of software and loaded onto the computing device 109...Figure 7 shows a body weight management system in Figure 6 alternatively wherein the diet- **tracking** tool resides on the server for the network provider 1 1 1. Computing device 109...recording in said journal the energy intake data associated with foods consumed employing the diet- **tracking** system tool provided by the body weight management
system provider;
e. recording in said journal...

...method for using the present invention, the subject utilizes a computing device wherein the diet- **tracking** tool is in ...the kit. She telephones the body weight manager system provider and registers herself as a **customer** and establishes her PIN. She then downloads the diet- **tracking** software onto her personal ...over the area in the upper arm. Said monitor comprises sensors to read, analyze and **store** selected body functions including pulse rate, body temperature, heat loss rate, skin sweat
19
level, **movement** accelerometer and other appropriate measures ... computer to download this data into the software mentioned above. In addition to the activity **monitoring** , she enters into the software, data regarding her food consumed. This information is routed through...also provides access the tools that the subject will use including an on-line diet- **tracking** system. The system provider will send to the subject energy expenditure devices including a physical...

...his computer into the diettracking network tool provided by the system provider. The subject also **tracks** his daily energy expenditure using the computer to enter his daily physical activity and metabolic...The system provider also provides access the tools that the subject will use including diet- **tracking** system software, energy expenditure devices including a physical activity monitor and a calorimeter as well...

...the present invention. The service provider sends over the Internet software tools including the diet- **tracking** software.

Other tools, such as the energy expenditure monitoring devices are shipped to him.

The subject loads the diet- **tracking** software onto his hand-held device such as a Palm Pilot@. He **tracks** her food intake by selecting the foods that are already found into the software program...

Claim
1. A body weight management system characterized by:
a. a diet- **tracking** system for estimating an individual's caloric intake over a set period
of time;
b...

...the individual.

2 The body weight management system according to Claim 1 wherein the diet- **tracking** system is selected from the group consisting of manual **tracking** systems, software **tracking** programs loaded onto a computing systems and combinations thereof.

3 The body weight management system...dccepting
data directly from the individual directly or from a peripheral devices;
d. a diet- **tracking** software program that is loaded onto said computing device;
e. a device measuring the energy...recording in the journal the energy intake data associated with foods consumed employing the diet- **tracking** system tool provided by the weight management
system provider;
24
e. recording in the journal...

5/3,K/94 (Item 14 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00848549 **Image available**
METHOD AND APPARATUS FOR MONITORING THE EFFECTIVE VELOCITY OF ITEMS THROUGH A STORE OR WAREHOUSE
PROCEDE ET APPAREIL PERMETTANT DE SURVEILLER LE TAUX DE ROTATION EFFECTIF D'ARTICLES DANS UN MAGASIN OU UN ENTREPOT
Patent Applicant/Assignee:
THE PROCTER & GAMBLE COMPANY, One Procter & Gamble Plaza, Cincinnati, OH 45202, US, US (Residence), US (Nationality)
Inventor(s):
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VACCARO Henry Sebastian, 164 Monte Vista, Los Alamos, NM 87544, US,
Legal Representative:

REED T David (et al) (agent), The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200182170 A2-A3 20011101 (WO 0182170)
Application: WO 2001US11392 20010406 (PCT/WO US0111392)
Priority Application: US 2000195689 20000407; US 2000196039 20000407
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT (utility model) AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ (utility model) CZ DE (utility model) DE DK (utility model) DK DM DZ EE (utility model) EE ES FI (utility model) FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK (utility model) SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 27852

Fulltext Availability:
Detailed Description

English Abstract
An item velocity **monitoring** system is provided which interfaces with a **consumer** retail **store** that has several cash registers that are tied into a "point of sale" **store** controller. The item velocity **monitoring** system is capable of detecting when sales (or other **movement** activities) of an item are occurring too quickly, or too slowly. The item velocity **monitoring** system is first "trained" in a learning mode of operations, during which item patterns and...

Detailed Description
... The retailer does not like (inverted exclamation mark)t because (inverted exclamation mark)t lowers **customer** service levels (Le. their customers can't get what they want, and. therefore may not...

...Accordingly, it is a primary advantage of the present invention to provide an item velocity **monitoring** system that typically interfaces with the **consumer** retail **store** data 1 5 warehouse or with individual **store** point-of-sale (POS) controllers, and which is capable of detecting when **movement** activities of items are oecurring abnonnally quickly or abnormally slowly.

lt is another advantage of the present invention to'provide an item velocity **monitoring** system that is first "trained" in a learning mode of operations, during which item pattems...

...by conventional point-of-sale (POS) systems, or by analyzing hourly or daily summaries of **store** item **movement** where the identity of individual purchase occasions is unavailable.

It is still a ftu-ther...by a method and apparatus according to one embodiment of the present invention which determines **customer** impact occasioned by an out-of-stock event.

Figure 13 is a flow chart illustrating...

...monitoring system is provided which interfaces with a consumer retail store (e.g., a grocery **store**) that has several cash registers that are tied into a "point of sale" (P.O.S., or POS) **store** controller, or which interfaces to a data warehouse or other data storage system where current POS transaction data, or hourly or daily POS data summaries, are retained. The item velocity **monitoring** system includes a personal computer for most retail **store** applications, although larger computers or smaller modular computers couId be used, depending upon the quantity **store** data in real time, and a modem or LAN is provided to communicate
8
with the POS **store** controller, or the data warehouse or other POS data storage system, and with a centralized location where ftu-ther data analysis is aceomplished, and. perhaps with other remote **monitoring** devices.

The item velocity **monitoring** system is capable of detecting when sales (or other movement activities) of an item are occurring too quickly, or too slowly. Both. types of information are very usefal to the **store** manager, since an item that is moving too quickly (Le., with respect to its "expected...

...movement) could be an indication that the item.

is either out-of-stock in the **store** , or on the shelf, or some other reason that: prevents consumer access to the item.

lf an item does not move for a designated amount of time, the item velocity **monitoring** system, will determine the current price of the item from. an Item Table stored on...

...a stored itera movement probability distribution model for the item. and. price, together with the **store** 's current sales velocity for either all items combined, or only those item in the...

...having to wait for the item to appear in a new transaction.

The item velocity **monitoring** system is first "trained" in a learning mode of operations, during which item pattems and...
...velocity event is detected, an event handling routine displays the event, and.

perhaps alerts the **store** manager (for more critical events), and ftirther can transmit the
9
event information over a...

...a 'Loyalty Out-ofStock System," or "LOSS,` which is incorporated in the above item. velocity **monitoring** system. This LOSS aspect of the invention is a computerized item stock-out detection and...

...OOS (also referred to.herein
as an `OOS event") by detecting items with abnormally high **movement** ; (4) automatically detecting and reporting on items that are 00 S at retail stores; (5...

...this means either data for individual POS transactions, or for hourly or daily sununaries of **movement** for individual items in each **store** , and that.

references to communicating with a POS controller may also mean communicating with 0...

...hereinbelow.

Referring now to the drawings, Figure 1 shows the general layout of a grocery **store** or other type of **consumer** retail□store□that has several cash registers that are tied into a `point of sale" (P.O.S., or POS) **store** controller. In addition to the standard cash 5 registers and POS **store** controller, an item velocity **monitoring** system is provided, generally designated by the reference numeral 10. ltem velocity nionitoring system 10...

...only one or two main integrated circuit chips. It will, be understood that item velocity **monitoring** system 10 incorporates the Loyalty Out-ofStock System, (Le., LOSS).

Personal computer 20 in the...all be combined into a single system, although the data provided by the item velocity **monitoring** system 1 0 of the present invention is really the critical information needed with respect...

...quickly than expected, then of course this item could become out-of-stock on the **store** shelf much more rapidly than would nonnally be expected. The **store** manager, once alerted to the situation, could then take steps to replenish the shelves with ftirther items that are stored back in the storage rooms of the **store** . Of course, if stock is low or already depleted in the storage rooms, then the **store** manager has a new problem and needs to order more of these items as soon are plenty of these items sornewhere else in the **store** . They could be on a different shelf which could be either a sales shelf or an incorrect shelf altogether, or they could be all in the **store** room or on a cart sorneplace where they are not in a condition for a...

...to purchase the item. None of these conditions are desirable, and again the item velocity **monitoring** system 1 0 of the present invention can notify the **store** manager of such an event so that the **store** manager can take corrective action in real time. It might be simply a matter of ...

...exclamation mark)tem's shelf space.

In a preferred mode of operation, the item velocity **monitoring** system uses a modified Poisson statistical model in which arrivals of items at the transaction...

...e @-t (e - lambda*) time units. In the preferred embodiment, time can be expressed in **store** sales (Le., in cumulative amounts of dollars being transacted since the previous observation of the...

...at noon on a Saturday than at midnight on a Sunday, and the incremental total **store** income (in dollars) can be used as
21
substitute "time" intervals to more accurately portray...

...to these statistical models include compensation for the fact that items being sold in a **store** often arrive at the point-of-sale cash registers in clumps because a consumer will buy several units of the sarne item in a single trip to the **store** .

This wouId, of course, need to be taken into account for an accurate item

velocity **monitoring** system that will not cause unnecessary alanns or "velocity event? as defined in the present invention.

The above adjustment (or "compensation") is accomplished by counting transactions (**shopping** baskets, in the case of a supermarket application) containing the item, rather than simply the...in other systems that do perform those tasks. Further, the LOSS of the present invention **tracks** recent sales and compares them to what was expected by the statistical model. When an...an OOS event, if the POS data contains a customer number. This analysis works by **tracking** what is out-of-stock when each identified customer shops. When the customer checks out analysis works by **tracking** what is out-of-stock when each identified customer shops. When the customer checks out...

5/3,K/95 (Item 15 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00818996 **Image available**
A VIDEO-BASED SYSTEM AND METHOD FOR DETECTING AND COUNTING PERSONS TRAVERSING AN AREA BEING MONITORED
SYSTEME ET PROCEDE VIDEO POUR LA DETECTION ET LE COMPTAGE DE PERSONNES TRAVERSANT UNE ZONE SURVEILLEE
Patent Applicant/Assignee:
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Patent Applicant/Inventor:
YAKOBI Ron, 21 Aharonovitz Street, 76348 Rehovot, IL, IL (Residence), IL (Nationality), (Designated only for: US)
TOPAZ Dov, 7A Harduf Street, 34747 Haifa, IL, IL (Residence), IL (Nationality), (Designated only for: US)
Legal Representative:
PEARL Zeev (et al) (agent), Eitan, Pearl, Latzer & Cohen-Zedek, 2 Gav Yam Center, 7 Shenkar Street, 46725 Herzlia, IL,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200152545 A1 20010719 (WO 0152545)
Application: WO 2001IL30 20010111 (PCT/WO IL0100030)
Priority Application: US 2000481447 20000113
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 11762

Fulltext Availability:
Claims

Claim
... and a method for obtaining and processing information about the quantity and the direction of **movement** of people in crowded

areas using video image processing
BACKGROUND OF THE INVENTION
Monitoring the **movement** of people entering and leaving major public areas, such as malls, **shopping** areas, chain-stores, casinos, airports, bus and train stations and sport facilities provides significant and...

...of entrances and exits of
people to and from a particular doorway of a specific **store** , within a period of time, enables the management to evaluate the **store** efficiency, and obtain a'correlation between the number of visitors and sales. Furthermore, it is possible by checking the number of visitors against employees, to check the employee/ **customer** ratio to determine whether the staff are overloaded and analyze the **customer** service being obtained vis-a-vis sales.
During the last few years, video image processing...

...and visual
image processing system have been developed in order to provide information
about the **movement** of people. Methods and apparatus using video based systems for obtaining information about the **movement** of people are known. For example, WO Application No: 98/08208, assigned to Footfall Ltd
...
...received from several end units, "turnstile.
2
The system does not actively search for and **track** figures over the whole
videoed area, but identifies the entry and exit of a figure...

5/3,K/96 (Item 16 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00535355 **Image available**
EVALUATION OF RESPONSES OF PARTICIPATORY BROADCAST AUDIENCE WITH PREDICTION OF WINNING CONTESTANTS: MONITORING, CHECKING AND CONTROLLING OF WAGERING, AND AUTOMATIC CREDITING AND COUPONING
EVALUATION DES REPONSES D'AUDITEURS PARTICIPANT A UNE EMISSION RADIODIFFUSEE AVEC PREDICTION DES GAGNANTS PARMI LES PARTICIPANTS: CONTROLE, VERIFICATION ET REGULATION DES PARIS, ET DISTRIBUTION AUTOMATIQUE DE CREDIT ET DE COUPONS
Patent Applicant/Assignee:
VON KOHORN Henry,
Inventor(s):
VON KOHORN Henry,
Patent Applicant/Inventor:
VON KOHORN Henry, 945 Treasure Lane, Vero Beach, FL 32963, US, US (Residence), US (Nationality)
Legal Representative:
GREEN Clarence A (agent), Perman & Green, LLP, 425 Post Road, Fairfield, CT 06430, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9966707 A2-A3 19991223
Application: WO 99US10850 19990517 (PCT/WO US9910850)
Priority Application: US 9888148 19980601
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH

GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN
MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW SD SL SZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 131080

Fulltext Availability:
Detailed Description

Detailed Description
... and scoring criteria between voice signals for an audio-only recording employing a single recording **track** ; Fig. 20 is a timing diagram showing simultaneous transmission of voice, synchronization, response and scoring criteria signal in an audio-only system employing a multiple **track** recording medium; Fige 21 shows schematically an alternative embodiment of the invention wherein the tape...removed from the dispenser 360 after imprinting. Also, the response unit 210 comprises a buffer **store** 366, a register 3681 a scoring logic unit 370, two comparators 372 and 374, two...synchronization signal, and the scoring and response criteria signals may be transmitted simultaneously on separate **tracks** of a recording medium, With either the video or audio-only recording and playback, it...this embodiment of the invention, may employ a recording medium having only a single recording **track** , In the central station 202 of Fig, 6. oscillators 242 and 244 were employed to...an audio tape recorder 520A having a recording tape medium with a plurality of recording **tracks** thereon, The stylized representation of the recorder 520A includes four recording/playback heads 584 connected...

...reference to Fig, 15. Each of the heads 584 is located above a corresponding recording **track** 586 in a tape recording medium 588, The medium ...Herein, the response-criteria signal and the scoring-criteria signal have been recorded on separate **tracks** so as to be coupled via lines 346 and 348 to the response unit 210A.

123
Similarly, separate **tracks** are employed for the synchronization signal and the voice signals. The use of the four separate **tracks** 586 permits the voice signals outputted by the amplifier 544, the synchronization signal of the...recorder 520A on Fig, 17, The recorder 520B includes a recording medium 588A having five **tracks** 586 as distinguished from the four **tracks** 586 on the medium 588 in Fig* 17, Fig* 21 has many of the components...

...a set of five heads 584 are employed for recording electric signals on the five **tracks** 586. A second set of heads 584 are provided for playback of the signals recorded on the **track** 586, The same or a different set of the heads 584 may be employed for...event on a TV-screen. Following the event, such as in a football game, a

track and field event,, or a move by a chess player, the producers of the TV...situation may be based on the outcome of a horse 186
race, as in off- **track** betting, wherein the identity of the horses varies from race to race, In this case...to qualify for a prize. For
example, in a form of betting known as "off **track** " betting on a horse race , there are odds governing payof f s to winners . The...

5/3,K/97 (Item 17 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00488477 **Image available**
ARTICLE-INFORMATION DISPLAY SYSTEM USING ELECTRONICALLY CONTROLLED TAGS
SYSTEME D'AFFICHAGE D'INFORMATIONS PRODUITS UTILISANT DES ETIQUETTES A COMMANDE ELECTRONIQUE
Patent Applicant/Assignee:
DISPLAY EDGE TECHNOLOGY LTD,
Inventor(s):
KAYSER Kenneth W,
FREDERICK W Richard,
SWARTZEL Stanley J,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9919829 A1 19990422
Application: WO 98US20281 19980928 (PCT/WO US9820281)
Priority Application: US 9761780 19971010; US 9767336 19971202; US 98118357 19980717; US 98118423 19980717; US 98118606 19980717; US 98118607 19980717; US 98118610 19980717; US 98118653 19980717; US 98120769 19980722
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 64929

Fulltext Availability:
Detailed Description

Detailed Description
... only one product. The tags may also include sensing circuity which detects the presence or **movement** of people in the vicinity of the tag. Information regarding **movement** can be used to alert store personnel to certain 0 adverse situations. For example, the lack of **movement** of a person about a tag can alert the **store** personnel to possible shoplifting.

The information to be displayed at each display tag 20 is...area controller per aisle; however, in an altenate embodiment one TAC exists for the entire **store** . Each area controller 31 is contained in an enclosed housing. The system controller 28 regularly communicates with the display tags for **monitoring** and reporting display tag accuracy and/or failures to the system user and for identifying...

...1 also illustrates a communication link 32 between the system controller 28 and an in- **store** computer 40 (see FIG. 2). This link 32 is also used by the system controller to receive update price information from the **store** computer 40 (FIG. 2). The same computer supplies data to both the tags and the...

...for the product is the same as the price displayed for and charged to the **customer** at the checkout scanner.

The system allows for central office control of the display tags...Among other functions provided by the system controller 28, the system controller 28 collects and **tracks** significant system events and prepares formatted reports of these events and the system controller facilitates...over the entire test. In other words, many self tests are performed and the CPU **tracks** the results.

1 5 Next, at step 2404, the accumulated self test failures are checked...

5/3,K/98 (Item 18 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT
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00485351 **Image available**

FUELING SYSTEM WITH WIRELESS DATA TRANSFER

SYSTEME DE RAVITAILLEMENT EN CARBURANT AVEC TRANSFERT DE DONNEES SANS FIL

Patent Applicant/Assignee:
GILBARCO LIMITED,

Inventor(s):
HARTSELL Hal Craig,

Patent and Priority Information (Country, Number, Date):
Patent: WO 9916703 A1 19990408
Application: WO 98GB2921 19980928 (PCT/WO GB9802921)
Priority Application: US 9760066 19970926; US 9824549 19980217

Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

Publication Language: English
Fulltext Word Count: 27078

Fulltext Availability:
Detailed Description

Detailed Description
... the present invention.

FIGURE 25 is a flow chart of a basic process for transaction **tracking** throughout numerous fueling environments according to the present invention.

FIGURES 26A and 26B are a...various characteristics of a signal emitted from the transponder are measured and monitored to determine **movement** as well as precise location. The antennas 248 associated with the central

positioning interface 246...

...act in conjunction with the various antennas throughout the fueling environunent to locate and monitor **movement** of the transponders in the fueling environment. Attention is drawn to US application Serial No... Multistage Ordering

One of the many unique aspects of the present invention is providing for **monitoring customer** position throughout the fueling environment in order to associate orders placed at the fuel dispenser with the particular **customer** that placed the order at the appropriate receiving point, such as the QSR drive-thru terminal and window 36, QSR transaction terminal 34 in the **store** , or, in the case of a car wash, at the car wash interface 48. In addition to associating the **customer** picking up the order with the appropriate order, the QSR can monitor or detect the position of the **customer** in the drive-thru line or elsewhere in the fueling environment to determine when to start order preparation.

For example, during the fueling operation, the **customer** may decide to order a few items from the QSR menu displayed at the dispenser...the car wash interface 48. The multistage ordering disclosed herein provides a solution for keeping **track** of various transactions in a ...central control system 50, alone or in conjunction with a remote host network 94, could **track** customer purchases and provide a benefit based on a purchase type or an amount of...

...to the customer.

The present invention provides a solution to the above problems by keeping **track** of cash customers and their respective refunds and loyalty points using transponder technology. A cash...an ID and the central control system 50 or remote host network 94 will keep **track** of the refund associated with that ID for later credit. Alternatively, the refund amount or...

...anywhere else in the store can interact with the customer transponder in order to keep **track** of loyalty points, benefit information or simply monitor the customer's purchasing habits. This information...may be sent to a database corresponding to the respective transponder in order to keep **track** of prepayment and associated totals. The accounting may be done at the transponder, wherein the...fueling position of a dispenser or interrogation system. In other aspects, it is desirable to **track** the transponder throughout the fueling environment 10. Although the embodiments described herein use the dispenser...process to repeat.

Figure 13B depicts an embodiment wherein the location of transponders may be **tracked** as they travel throughout the service station environment 10. In this embodiment, the dispensers 18...of stolen transponders in a number of ways. Preferably, a database is maintained, which keeps **track** of stolen or lost transponder ID's and is checked by the dispenser or central...

...the transponder to download any transaction history or information available on the transponder to help **track** unauthorized uses and determine the identification of the unauthorized user (block 1035). For example, the transponder may be able to **track** the various locations in which the user attempted to use the transponder. If the user...while maintaining communication ability. In the latter case, the transponder may be used to help **track** unauthorized transaction attempts and identify the unauthorized user.

The dispenser will also disable the present...provide prepaid functions

directly on the transponder. In order to provide additional transaction security and **tracking** , a further aspect of the present invention is creating a shadow ledger at the central...provides an up-to-date accounting accessible when the transponder is unavailable for communications.

Transaction **Tracking**
The present invention also provides an embodiment adapted to **track** transponder transactions throughout a number of fueling environments operatively associated with the host network 94.

The basic flow of transaction **tracking** is shown in Figure 25 wherein a typical fueling operation begins (block 1400) by a...

5/3,K/99 (Item 19 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00485350 **Image available**
FUEL DISPENSING SYSTEM WITH PREPAYMENT MEANS LINKED TO A TRANSPONDER
SYSTEME DE DISTRIBUTION DE CARBURANT A MOYENS DE PREPAIEMENT EN ASSOCIATION AVEC UN TRANSPONDEUR
Patent Applicant/Assignee:
GILBARCO LIMITED,
Inventor(s):
MARION Kenneth O,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9916702 A1 19990408
Application: WO 98GB2915 19980928 (PCT/WO GB9802915)
Priority Application: US 9760066 19970926; US 9835158 19980305
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 27099

Fulltext Availability:
Detailed Description

Detailed Description
... the present invention.

FIGURE 25 is a flow chart of a basic process for transaction **tracking** throughout numerous fueling environments according to the present invention.

FIGURES 26A and 26B are a ...various characteristics of a signal emitted from the transponder are measured and monitored to determine **movement** as well as precise location. ...act in conjunction with the various antennas throughout the fueling environment to locate and monitor **movement** of the transponders in the fueling environment. Attention is drawn to US application Serial No...

...Multistage Ordering
One of the many unique aspects of the present invention is providing for **monitoring** **customer** position throughout the fueling environment in order to associate orders placed at the fuel dispenser with the particular **customer** that placed the order at the appropriate receiving point, such as the QSR drive-thru terminal and window 36, QSR transaction terminal 34 in the **store** , or, in the case of a car wash, at the car wash interface 48. In addition to associating the **customer** picking up the order with the appropriate order, the QSR can monitor or detect the position of the **customer** in the drive-thru line or elsewhere in the fueling environment to determine when to start order preparation.

For example, during the fueling operation, the **customer** may decide to order a few items from the QSR menu displayed at the dispenser...the car wash interface 48. The multistage ordering disclosed herein provides a solution for keeping **track** of various transactions in a fueling environment where customer orders are picked up in locations...central control system 50, alone or in conjunction with a remote host network 94, could **track** customer purchases and provide a benefit based on a purchase type or an amount of...to the customer.

The present invention provides a solution to the above problems by keeping **track** of cash customers and their respective refunds and loyalty points using transponder technology. A cash...
...an ID and the central control system 50 or remote host network 94 will keep **track** of the refund associated with that ID for later credit. Alternatively, the refund amount or...

...anywhere else in the store can interact with the customer transponder in order to keep **track** of loyalty points, benefit information or simply monitor the customer's purchasing habits. This infon...may be sent to a database corresponding to the respective transponder in order to keep **track** of prepayment and associated totals. The accounting may be done at the transponder, wherein the...fueling position of a dispenser or interrogation system. In other aspects, it is desirable to **track** the transponder throughout the fueling environment 10. Although the embodiments described herein use the dispenser...process to repeat.

Figure 13B depicts an embodiment wherein the location of transponders may be **tracked** as they travel throughout the service station environment 10. In this embodiment, the dispensers 18...of stolen transponders in a number of ways. Preferably, a database is maintained, which keeps **track** of stolen or lost transponder ID's and is checked by the dispenser or central...the transponder to download any transaction history or information available on the transponder to help **track** unauthorized uses and determine the identification of the unauthorized user (block 1035). For example, the transponder may be able to **track** the various locations in which the user attempted to use the transponder. If the user ...

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Transaction **Tracking**
The present invention also provides an embodiment adapted to **track** transponder transactions throughout a number of fueling environ-nents operatively associated with the host network 94.

The basic flow of transaction **tracking** is shown in Figure 25 wherein a typical fueling operation begins (block 1400) by a...

5/3,K/100 (Item 20 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00485349 **Image available**
FUEL DISPENSING AND RETAIL SYSTEM FOR PROVIDING LOYALTY AND CUSTOMER BENEFITS
SYSTEME DE DISTRIBUTION DE COMBUSTIBLE ET DE VENTE AU DETAIL PERMETTANT D'OFFRIR DES PROMOTIONS DE FIDELISATION A DES CLIENTS
Patent Applicant/Assignee:
GILBARCO LIMITED,
Inventor(s):
MARION Kenneth O,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9916701 A1 19990408
Application: WO 98GB2869 19980928 (PCT/WO GB9802869)
Priority Application: US 9760066 19970926; US 9824493 19980217; US 9824491 19980217
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 21708

Fulltext Availability:
Detailed Description

Detailed Description
... the present invention.

FIGURE 25 is a flow chart of a basic process for transaction **tracking** throughout numerous fueling environments according to the present invention.

FIGURES 26A and 26B are a...various characteristics of a signal emitted from the transponder are measured and monitored to determine **movement** as well as precise location. The antennas 248 associated with the central positioning interface 246...

...act in conjunction with the various antennas throughout the fueling environment to locate and monitor **movement** of the transponders in the fueling environment. Attention is drawn to US application Serial No...

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One of the many unique aspects of the present invention is providing for **monitoring customer** position throughout the fueling environment in order to associate orders placed at the fuel dispenser with the particular **customer** that placed the order at the appropriate receiving point, such as the QSR drive-diru terminal and window 36, QSR transaction terminal 34 in the **store** , or, in the case of a car wash, at the car wash interface 48. In addition to associating the **customer** picking up the order with the appropriate order, the QSR can monitor or detect the position of the **customer** in the drive-thru line or elsewhere in the fueling environment to detennine when to start order preparation.

For example, during the fueling operation, the **customer** may decide to order a few items from the QSR menu displayed at the dispenser...the car wash interface 48. The multistage ordering disclosed herein provides a solution for keeping **track** of various transactions in a fueling environment where customer orders are picked up in locations...central control system 50, alone or in conjunction with a remote host network 94, could **track** customer purchases and provide a benefit based on a purchase type or an amount of...to the customer.
The present invention provides a solution to the above problems by keeping **track** of cash customers and their respective refunds and loyalty points using transponder technology. A cash...

...an ID and the central control system 50 or remote host network 94 will keep **track** of the refund associated with that ID for later credit. Alternatively, the refund amount or...

...anywhere else in the store can interact with the customer transponder in order to keep **track** of loyalty points, benefit information or simply monitor the customer's purchasing habits. This information...may be sent to a database corresponding to the respective transponder in order to keep **track** of prepayment and associated totals. The accounting may be done at the transponder, wherein the...fueling position of a dispenser or interrogation system. In other aspects, it is desirable to **track** the transponder throughout the fueling enviromnent 10. Although the embodiments described herein use the dispenser...process to repeat.

Figure 13B depicts an embodiment wherein the location of transponders may be **tracked** as they travel throughout the service station environment 10. In this embodiment, the dispensers 18...

5/3,K/101 (Item 21 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00485348 **Image available**
A FORECOURT ORDERING SYSTEM FOR FUEL AND SERVICES AT A FILLING STATION
SYSTEME DE PRISE DE COMMANDE EN AVANT-COUR POUR CARBURANT ET SERVICES DANS UNE STATION-SERVICE
Patent Applicant/Assignee:
GILBARCO LIMITED,
Inventor(s):
DICKSON Timothy Earle,
MARION Kenneth Orvin,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9916700 A1 19990408
Application: WO 98GB2919 19980928 (PCT/WO GB9802919)
Priority Application: US 9760066 19970926; US 9834969 19980304; US 98119905 19980721

Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 7956

Fulltext Availability:
Detailed Description

Detailed Description
... fuel dispensers and systems capable of communicating with various types of transponders and detecting their **movement** within and throughout a fueling environment.

In recent years, traditional gasoline pumps and service stations...

...not limited to the purchase of fuel at the dispenser. More recent dispensers allow the **customer** to purchase services, such as car washes, and goods, such as fast food or convenience **store** products at the dispenser. Once purchased, the **customer** need only pick up the goods and services at the station **store** or the outlet of a vending machine.

Remote transaction systems have evolved wherein the fuel...
...automatically.

Given the sophistication of these transaction systems and the numerous choices provided to the **customer** at the dispenser. conducting transactions with transponders will be useful to allow the dispenser and fuel station **store** to monitor the **movement** of a person carrying a transponder and a vehicle having a transponder, enhance transaction and ...

...improve safety in the fueling environment.

Summary of the Invention
The present invention relates to **monitoring** a **customer** position throughout a fueling environment in order to associate orders placed at the fuel dispenser with a particular **customer** at an appropriate receiving point. The receiving point may be a quick-serve restaurant drive...

...receive products or services ordered at the fuel dispenser. In addition to associating the appropriate **customer** with the order being picked up, operators of a quick-serve restaurant (QSR) can monitor or detect the position of the **customer** in the drive-thru lane or elsewhere in the fueling environment to determine when to start order preparation. For example, during the fueling operation, the **customer** may decide to order a few items from a QSR menu at the dispenser. As the **customer** enters the order, the order is associated with the transponder carried by the **customer** or mounted on the **customer** 's vehicle.

As an alternative to providing an order at an order entry interface on... at the intermediate location.

100
The present invention solves the unique problems associated with keeping **track** of orders from a QSR in a fueling environment. In such an environment, orders for...the local presence of the transponder associated with a number of 240 vehicles may be **tracked** throughout the fueling environment by one or more antenna arrangements as described in detail in...the car wash interface 48. The multistage ordering disclosed herein provides a solution for keeping **track** of various transactions in a fueling environment where customer orders are 550 picked up in...

5/3,K/102 (Item 22 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00475731 **Image available**
METHOD AND APPARATUS FOR REDUCING SIGNAL BLOCKING AND FADING THROUGH USE OF A DUAL SATELLITE COVERAGE
PROCEDE ET APPAREIL DE REDUCTION DU BLOCAGE ET DE L'AFFAIBLISSEMENT DES SIGNAUX AU MOYEN D'UNE DOUBLE COUVERTURE SATELLITE
Patent Applicant/Assignee:
MOTOROLA INC,
Inventor(s):
KRUTZ Michael William,
REDDEN James Powers,
TAYLOE Daniel Richard,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9907083 A1 19990211
Application: WO 98US12029 19980610 (PCT/WO US9812029)
Priority Application: US 97905623 19970804
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
CA CN DE FI GB JP SE
Publication Language: English
Fulltext Word Count: 9467
Fulltext Availability:
Detailed Description

Detailed Description
... step 314, a secondary RF channel is established. In a preferred embodiment, a dual-coverage **subscriber** unit uses separate processing paths for the primary and secondary channels, and it can multiplex...of timeslots is determined by the system design. The two separate RF subsystems process and **store** data in parallel. The data is processed into blocks based on the timeslot information and...

...looking for candidate beams which will be used for future hand-offs. A dual-coverage **subscriber** unit evaluates candidate beams to replace both the primary channel and the secondary channel. The...

...to determine when hand-off conditions are occurring. Hand-off conditions occur because of relative **movement** between the satellites and the DCSU. When the DCSU is **monitoring** signals from two different satellites, then hand-off conditions can occur with either satellite. Typically...In this case, this can be done because the DCSU has the ability to simultaneously **track**

two channels. The common controller determines which data blocks to

5/3,K/103 (Item 23 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT
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00325605
POINT OF PURCHASE VIDEO DISTRIBUTION SYSTEM
SYSTEME DE DISTRIBUTION VIDEO DESTINE A UN POINT D'ACHAT
Patent Applicant/Assignee:
BYLON COMPANY LTD,
CHO Nack Y,
MAGILTON Jerry E Jr,
Inventor(s):
CHO Nack Y,
MAGILTON Jerry E Jr,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9608113 A1 19960314
Application: WO 95US11431 19950905 (PCT/WO US9511431)
Priority Application: US 94301320 19940906
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AM AT AU BB BG BR BY CA CH CN CZ DE DK EE ES FI GB GE HU IS JP KE KG KP KR KZ LK LR LT LU LV MD MG MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TT UA UG US UZ VN KE MW SD SZ UG AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 10852

Fulltext Availability:
Detailed Description
Claims

Detailed Description
... video program segments to the receiving sites, (2) receivers which receive the segments, (3) a **tracking** system which **tracks** the product movement at the receiving sites, (4) a network management system which forms playlists...or other such promotion. Additionally, purchase time, aisle where purchased, and cashier information can be **tracked** for monitoring product movement (sales of consumer goods) in each receiving site, The monitoring of...in conjunction with the network management software to provide the desired program for display.

D, **Tracking** Syste
In the preferred embodiment of the invention, a **tracking** system is utilized to **track** purchase time, aisle where purchased and cashier information for product **movement** (sales of **consumer** goods) in each receiving site 254, This PC based system is a user friendly database system which automatically collects data from the stores, The **monitoring** of product **movement** is used to determine the effectiveness of the overall system and to refine the system this collected data at technical operation center 200.

In the preferred embodiment, the **tracking** system

utilizes a Pentium based PC which runs a FoxPro database,
This database/PC is...

...The FoxPro
database interfaces with Receiving PC 258 and downloads a full day of product **movement** information from each **store** . This downloading can be done through a modem (phone line). The FoxPro database then provides...on a global basis.

The network management system is really a trafficking system which keeps **track** of the all the clips at each local library. The network management system can change...
...receiving site.

Fe Software
In the preferred embodiment, a software scheme is used for the **Tracking** System and the Network Management System (including software for databases and forms), The software described...

Claim
... program
segments to a plurality of receiving sites;
receivers located at the receiving sites;
a **tracking** system **tracking** product movement at the receiving sites;
a network management system forming playlists for each of...

...inputs from a user,
the user having access to the product movement information from the **tracking** system; and
display units for displaying the playlists at the receiving sites.
1 5

2 The video media distribution network of claim I wherein the **tracking** system **tracks** previously played program segments and wherein the network management system determines the playlists in response...
...and the video program segments
having associated clip numbers;
receivers located at the stores;
a **tracking** system **tracking** product movement at the stores and **tracking** previously played program segments at the stores, the **tracking** system organizing information based on the receiver addresses ...desired playlist.

19 The method of broadcasting video program segments in cldim 18 further comprising:
tracking previously played program segments; and
forming a desired playlist in response to both product movement...

5/3,K/104 (Item 24 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00279231 **Image available**

VIDEO TRAFFIC MONITOR FOR RETAIL ESTABLISHMENTS AND THE LIKE
MONITEUR DE TRAFIC VIDEO POUR SURFACES DE VENTE AU DETAIL ET EMPLACEMENTS SIMILAIRES

Patent Applicant/Assignee:
RCT SYSTEMS INC,
Inventor(s):
CONRAD Gary L,
DENENBERG Byron A,
KRAMERICH George L,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9427408 A1 19941124
Application: WO 94US5121 19940509 (PCT/WO US9405121)
Priority Application: US 9362306 19930514
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AU CA CN JP AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
Publication Language: English
Fulltext Word Count: 10096
Fulltext Availability:
Detailed Description
Claims

Detailed Description
... computer vision has provided a number of approaches to the interesting problem of detecting and **tracking** moving objects. Some of the tools or algorithms used are auto-correlation, optical flow, edge...

...Search -- the objects of interest must be identified and isolated as individual targets; and
(2) **Track** -- the objects must be traced from their previous position to their present position.

The ease...the image. Once the video processor locates an object of interest, the video processor must **track** the object of interest through the maze of other objects while being given a constant stream of updates. Unfortunately, the task of searching and **tracking** objects in this manner requires a lot of computing power which translates into increased costs...

...Of The Invention
An object of the present invention is to provide an improved traffic **monitoring** system for inexpensive, real time **monitoring** of the number of people simultaneously entering and exiting a retail pedestrian traffic zone, such as an entrance to a **shopping** mall.

A related object of the invention is to provide such an improved **monitoring** system which determines the direction of **movement** of the people, as well as the number of people, traversing the monitored zone.

Another object of the present invention is to provide an improved video traffic **monitoring** system for accurately **monitoring** the people simultaneously entering and exiting a retail traffic zone without requiring the computing power...

...systems.

Still another object of the present invention is to provide an improved video traffic **monitoring** system for determining a real time count of the number of people currently within a...

...apparent from the following detailed description and the accompanying drawings.
The video traffic monitor examines **customer movement** in a retail or similar environment, such as a department **store** , where people are simultaneously entering or exiting a traffic zone, such as the entrance to the department **store** . The video traffic monitor provides information relating to the number of people entering or exiting the traffic zone. This **customer movement** information assists in determining **customer** traffic flow to determine the effectiveness of advertisements and displays, compliance with fire ordinances or other general **customer** traffic information. Counting people simultaneously entering or exiting a ...the people come to the present invention.

In this way, the present invention provides video **monitoring** of a traffic zone, characterized by people simultaneously traversing the traffic zone in different directions...will overlap from the past to the present cycle and thus provide a means of **tracking** the person through the window and logically determining when that person has left the window ...

Claim
1 A method of **monitoring** and counting retail customers traversing wide zones of a retail mall or **store** , said method comprising the steps of
positioning an overhead video camera to produce a video image extending across a zone to be monitored for **customer movement** , digitizing said video image at repetitive time intervals to produce digital information representing said video...

...across the zone to be monitored, in a direction transverse to the direction of people
movement through said zone, to determine
(1) the number of people traversing said zone in a prescribed time interval, and
(2) the direction of **movement** of said people through said zone.

2 The method of claim I wherein the width...

5/3,K/105 (Item 1 from file: 610)
DIALOG(R)File 610:Business Wire
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01014041 20040112012B5591 (USE FORMAT 7 FOR FULLTEXT)
CommerceQuest Announces Retail Edition of TRAXION Business Process Management Suite-PM4Retail(SM) Provides Retailers with Real-Time Visibility into Enterprise Processes and Rapid Analysis of Transactional Data, Multiple Store...
Business Wire
Monday, January 12, 2004 08:04 EST
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 916

...at the store level.

"The fast-paced retail environment demands successful execution of promotions,

exceptional **customer** service and innovative loss prevention initiatives, requiring organizations to maintain accurate and efficient support of...

...their business process efficiencies by integrating human workflow tasks, head-office systems and databases and **store** controllers to access and
manage all relevant resources such as people, stores, warehouses, inventory,
pricing...

...QuikTrax Process Accelerators for the
retail market, including Accounting for Cash, Loss Prevention, Promotions Management, **Store** Opening and Provisioning, Labor Scheduling, Master Scheduling, Distribution Center Optimization, and Six Sigma Process Improvement

-- File and Data Integration
-- Allows file **movement** and integration between point-of-sale controllers, distribution centers and head office systems, including mainframe systems, eliminating the often costly and error prone **store** polling operation
-- Data integration solutions are available on multiple platforms including OS/390, Tandem, OS...

...exit options to
extend and adapt the product to the specific integration needs
-- Comprehensive process **monitoring** , auditing and status data access via a Web-based user interface to gain real-time...

...BusinessWire.com.

-0-

KEYWORD: NEW YORK FLORIDA **TRACK**
INDUSTRY KEYWORD: RETAIL
E-COMMERCE
INTERNET
SOFTWARE
HARDWARE
PRODUCT
TRADESHOW

5/3,K/106 (Item 2 from file: 610)
DIALOG(R)File 610:Business Wire

01009529 20031229363B1886 (USE FORMAT 7 FOR FULLTEXT)
Statement by Digital Angel Corp.
Business Wire
Monday, December 29, 2003 09:02 EST
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 580

TEXT:

...that its
proprietary, microchip meat safety systems are specifically designed to completely fulfill the livestock **tracking** and tracing needs necessary to minimize the human and animal health effects of "mad cow...

...national health advocates who have called for the immediate
adoption of a comprehensive national cattle **tracking** and identification program.

Digital Angel's electronic technology, including patented FDA-approved RFID (Radio Frequency...

...food safety verification tool, the Digital Angel
systems allow producers to automatically collect, report and **store** data on
individual animals, personnel and husbandry practices. These systems help the
producing and processing...

...only with safety issues, but also
herd efficiency goals and the other information demands of **consumer** -branded
meat products.

About Digital Angel Corp.

Digital Angel Corporation develops and deploys sensor and communications technologies that enable rapid and accurate identification, location **tracking** ,
and condition **monitoring** of high-value mobile assets. Applications for the
Company's products include identification and **monitoring** of pets, fish and
livestock through its patented implantable microchips; location **tracking** and
message **monitoring** of vehicles and aircraft in remote locations through systems that integrate GPS and geosynchronous satellite communications; and **monitoring** of asset conditions such as temperature and **movement** , through
advanced miniature sensors.

Digital Angel Corporation is majority-owned by Applied Digital Solutions, Inc...

5/3,K/107 (Item 3 from file: 610)
DIALOG(R)File 610:Business Wire

00716539 20020519139B0266 (USE FORMAT 7 FOR FULLTEXT)
TransCore and Gatekeeper Systems Inc Strike Partnership, Uniting Leaders in Wireless, Automated Ground Transportation Management Systems-Technology and Software Companies Team to Offer Airports Systems that Manage Ground Traffic,...
Business Wire
Sunday, May 19, 2002 09:00 EDT
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 911

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5/3,K/108 (Item 4 from file: 610)
DIALOG(R)File 610:Business Wire

00152998 19991208342B0123 (USE FORMAT 7 FOR FULLTEXT)
ISS Ships SAFEsuite Decisions 2.1, Adds Support for Oracle8
Business Wire
Wednesday, December 8, 1999 08:22 EDT
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 1,019

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5/3,K/109 (Item 1 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

03600742 Supplier Number: 111702283 (USE FORMAT 7 FOR FULLTEXT)
REPEAT/Statement by Digital Angel Corp.
Business Wire, p5158
Dec 29, 2003
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 563

... that its proprietary, microchip meat safety systems are specifically designed to completely fulfill the livestock **tracking** and tracing needs necessary to minimize the human and animal health effects of "mad cow...

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DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

03600716 Supplier Number: 111702257 (USE FORMAT 7 FOR FULLTEXT)
Statement by Digital Angel Corp.
Business Wire, p5115
Dec 29, 2003
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 560

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DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

03198111 Supplier Number: 86004091 (USE FORMAT 7 FOR FULLTEXT)

TransCore and Gatekeeper Systems Inc Strike Partnership, Uniting Leaders in Wireless, Automated Ground Transportation Management Systems.

Business Wire, p2001
May 19, 2002
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 952

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DIALOG(R)File 621:Gale Group New Prod.Annou.(R)
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02252683 Supplier Number: 58071829 (USE FORMAT 7 FOR FULLTEXT)
ISS Ships SAFEsuite Decisions 2.1, Adds Support for Oracle8.
Business Wire, p0123
Dec 8, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 981

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(c) 2005 The Gale Group. All rts. reserv.

01795269 Supplier Number: 53630160 (USE FORMAT 7 FOR FULLTEXT)
2000 Online Merchants Help Launch the Internet's Largest Self-Regulatory Online Privacy Program.
PR Newswire, p0187
Jan 25, 1999
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 631

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5/3,K/114 (Item 6 from file: 621)

DIALOG(R)File 621:Gale Group New Prod.Annou.(R)
(c) 2005 The Gale Group. All rts. reserv.

01727664 Supplier Number: 53079552 (USE FORMAT 7 FOR FULLTEXT)
Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems.
Business Wire, p1247
Oct 13, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 577

... Interlott MVP secure lottery ticket dispensing system. This prototype interface is designed to help C- **Store** retailers **track** and control lottery tickets while increasing ticket sales.

Eric Hinkle, Radiant Systems' President and Chief...

...first direct connectivity to a smart lottery ticket device; a milestone for the Petroleum & C- **store** industry."

The integration drives multiple benefits to C- **store** operators, including:

-- Total physical ticket security

-- Increased **customer** throughput (by moving lottery customers out of the POS area to make ticket selections)

-- Detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting

-- Elimination of "cross-rings" and other ticket theft practices

-- Faster Shift changes...

5/3,K/115 (Item 1 from file: 634)

DIALOG(R)File 634:San Jose Mercury
(c) 2005 San Jose Mercury News. All rts. reserv.

10804018

CHIP THAT CAN TRACK **YOUR EVERY MOVE TO BE UNVEILED TODAY WILL PRIVACY RISKS OUTWEIGH BENEFITS?**

San Jose Mercury News (SJ) - Monday, October 30, 2000
By: ANICK JESDANUN, Associated Press
Edition: Morning Final Section: Business Monday Page: 17E
Word Count: 764

CHIP THAT CAN TRACK **YOUR EVERY MOVE TO BE UNVEILED TODAY WILL PRIVACY RISKS OUTWEIGH BENEFITS?**

TEXT:
Location **tracking** , coming to a mobile device near you, will be able to pinpoint your whereabouts to...

...to virtual stalking.

Cell phones, handheld devices, even car navigation systems will soon have detailed **tracking** abilities, if they do not already. Services could begin appearing within a year or so...

...to make money?

''There's going to be a dramatic increase in the amount of **tracking** that's made possible, in part by services they don't know they have,'' said ...

... Weitzner of the World Wide Web Consortium, which sets technical standards for the Web.

Such **tracking** will let someone visit a Web site and automatically get weather, movie showings or neighborhood...

...can be pointed to the nearest bank machine.

But if the information is stored, location **tracking** could result in a 24-hour-a-day record of a person's whereabouts.

So...

...social service agent wants to know how many times a person has visited a candy **store** with their child?

''You have to ask, 'Who gets how much information?' '' said Jason Catlett, chief executive of Junkbusters Corp., a non-profit privacy **monitoring** group in Green Brook, N.J.

''Telephone records are routinely subpoenaed. They can be very intrusive, but far more intrusive is a complete log of your physical **movement** .''

But companies looking to gain business from location **tracking** insist that the worst-case scenarios presented are impractical to implement in reality.

''There's...

... for Starbucks to monitor everyone's location on the off chance they can acquire a **customer** ,'' said Jason Devitt, chief executive of Vindigo,

which offers 11 city guides through Palm organizers...

...it right the first time.''

In many ways, a person's whereabouts are already being **tracked** .

Employee security cards record when people enter buildings. Discount grocery programs **track** what people buy, where and when. Electronic toll-payment systems know when someone traverses a...

5/3,K/116 (Item 1 from file: 810)
DIALOG(R)File 810:Business Wire
(c) 1999 Business Wire . All rts. reserv.

0921126 BW1247

RADIANT SYSTEMS: Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems

October 13, 1998

Byline: Business Editors

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5/3,K/117 (Item 1 from file: 813)
DIALOG(R)File 813:PR Newswire
(c) 1999 PR Newswire Association Inc. All rts. reserv.

1409324 LAM054
2000 Online Merchants Help Launch the Internet's Largest Self-Regulatory Online Privacy Program

DATE: January 25, 1999 09:03 EST WORD COUNT: 636

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5/3,K/118 (Item 2 from file: 813)
DIALOG(R)File 813:PR Newswire

0980510 NYM004
NPD's INTELECT PURCHASES Elrick & Lavidge's ELCAP

DATE: August 5, 1996 08:00 EDT WORD COUNT: 461

, Aug. 5 /PRNewswire/ -- INTELECT, a leading supplier of retail sales **tracking** information for the **consumer** electronics industry, has acquired the Elrick & Lavidge Computerized Audit Program (ELCAP), which monitors the major...

...appliance industry in the U.S. The purchase significantly broadens INTELECT's coverage of the **consumer** durables industry, giving marketers a central resource for **store** **movement** data across multiple categories.

"With the additon of the ELCAP business, we're able to offer INTELECT clients complete coverage of the **consumer** electronics and durables industry," commented Bill Lucas, president of NPD Syndicated Services. "Since 1986 INTELECT has been the premier provider of **consumer** electronics equipment such as TVs and stereos -- and on photographic equipment, small domestic appliances, and...
...major domestic appliance marketers a global resource. "Through our international partner GfK, INTELECT was already **monitoring** major domestic appliances in Europe and Asia," explained INTELECT Vice President, Clark Johnson. "All subscribers...

...upcoming weeks."

About INTELECT

Formed in 1986, INTELECT is a leading provider of retail sales **tracking** information for the **consumer** electronics and durables industry in the U.S. and around the world. In addition to...
?

T S5/3,K/105-120

5/3,K/105 (Item 1 from file: 610)
DIALOG(R)File 610:Business Wire

01014041 20040112012B5591 (USE FORMAT 7 FOR FULLTEXT)
CommerceQuest Announces Retail Edition of TRAXION Business Process Management Suite-PM4Retail(SM) Provides Retailers with Real-Time Visibility into Enterprise Processes and Rapid Analysis of Transactional Data, Multiple Store...
Business Wire
Monday, January 12, 2004 08:04 EST
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 916

...at the store level.

"The fast-paced retail environment demands successful execution of promotions,
exceptional **customer** service and innovative loss prevention initiatives, requiring organizations to maintain accurate and efficient support of...

...their business process efficiencies by integrating human workflow tasks, head-office systems and databases and **store** controllers to access and
manage all relevant resources such as people, stores, warehouses, inventory,
pricing...

...QuikTrax Process Accelerators for the
retail market, including Accounting for Cash, Loss Prevention, Promotions Management, **Store** Opening and Provisioning, Labor Scheduling, Master Scheduling, Distribution Center Optimization, and Six Sigma Process Improvement

-- File and Data Integration
-- Allows file **movement** and integration between point-of-sale controllers, distribution centers and head office systems, including mainframe systems, eliminating the often costly and error prone **store** polling operation
-- Data integration solutions are available on multiple platforms including OS/390, Tandem, OS...

...exit options to
extend and adapt the product to the specific integration needs
-- Comprehensive process **monitoring** , auditing and status data access via a Web-based user interface to gain real-time...

...BusinessWire.com.

-0-

KEYWORD: NEW YORK FLORIDA **TRACK**
INDUSTRY KEYWORD: RETAIL
E-COMMERCE
INTERNET
SOFTWARE
HARDWARE
PRODUCT
TRADESHOW

5/3,K/106 (Item 2 from file: 610)
DIALOG(R)File 610:Business Wire

01009529 20031229363B1886 (USE FORMAT 7 FOR FULLTEXT)
Statement by Digital Angel Corp.
Business Wire
Monday, December 29, 2003 09:02 EST
JOURNAL CODE: BW LANGUAGE: ENGLISH RECORD TYPE: FULLTEXT
DOCUMENT TYPE: NEWSWIRE
WORD COUNT: 580

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Word Count: 631

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"Our goal was to accelerate implementation of good privacy practices ...

...Public Eye. "Moreover, the program is truly self regulating. Though privacy statement creation, publishing and **monitoring** are facilitated by Public Eye, compliance, assessment and resolution are completely in the hands of...

...and their patrons. The key is the giant spot light created by Public Eye's **monitoring** and reporting system. It creates a compelling incentive for members to make sure that their...

...on the Internet but to serve as a catalyst to boost the fledgling privacy practices **movement** . Hopefully the Public Eye program will serve as a conduit to steer merchants toward more...

...end.

About Public Eye

Public Eye tests, certifies, and monitors Internet businesses for reliability and **customer** satisfaction. Launched in May of 1996 Public Eye has emerged as a leader in providing consumers and merchants with **consumer** confidence building services and products. The company is the organizer of the alliance of Certified Safe **shopping** sites. This network of registered merchants have agreed to be monitored for reliability and **customer** satisfaction, and to openly display the record to online consumers. Public Eye's **monitoring** service allows Internet consumers to access useful reliability reports so they can check out these...

5/3,K/114 (Item 6 from file: 621)
DIALOG(R)File 621:Gale Group New Prod.Annou.(R)

01727664 Supplier Number: 53079552 (USE FORMAT 7 FOR FULLTEXT)
Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems.
Business Wire, p1247

Oct 13, 1998
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 577

... Interlott MVP secure lottery ticket dispensing system. This prototype interface is designed to help C- **Store** retailers **track** and control lottery tickets while increasing ticket sales.
Eric Hinkle, Radiant Systems' President and Chief...

...first direct connectivity to a smart lottery ticket device; a milestone for the Petroleum & C- **store** industry."
The integration drives multiple benefits to C- **store** operators, including:
-- Total physical ticket security
-- Increased **customer** throughput (by moving lottery customers out of
the POS area to make ticket selections)
-- Detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting
-- Elimination of "cross-rings" and other ticket theft practices
-- Faster Shift changes...

5/3,K/115 (Item 1 from file: 634)
DIALOG(R)File 634:San Jose Mercury

10804018
CHIP THAT CAN TRACK **YOUR EVERY MOVE TO BE UNVEILED TODAY WILL PRIVACY RISKS OUTWEIGH BENEFITS?**
San Jose Mercury News (SJ) - Monday, October 30, 2000
By: ANICK JESDANUN, Associated Press
Edition: Morning Final Section: Business Monday Page: 17E
Word Count: 764

CHIP THAT CAN TRACK **YOUR EVERY MOVE TO BE UNVEILED TODAY WILL PRIVACY RISKS OUTWEIGH BENEFITS?**

TEXT:
Location **tracking** , coming to a mobile device near you, will be able to pinpoint your whereabouts to...

...to virtual stalking.

Cell phones, handheld devices, even car navigation systems will soon have detailed **tracking** abilities, if they do not already. Services could begin appearing within a year or so...

...to make money?

''There's going to be a dramatic increase in the amount of **tracking** that's made possible, in part by services they don't know they have,'' said ...

... Weitzner of the World Wide Web Consortium, which sets technical standards for the Web.

Such **tracking** will let someone visit a Web site and automatically get weather, movie showings or neighborhood...

...can be pointed to the nearest bank machine.

But if the information is stored, location **tracking** could result in a 24-hour-a-day record of a person's whereabouts.

So...

...social service agent wants to know how many times a person has visited a candy **store** with their child?

''You have to ask, 'Who gets how much information?' '' said Jason Catlett, chief executive of Junkbusters Corp., a non-profit privacy **monitoring** group in Green Brook, N.J.

''Telephone records are routinely subpoenaed. They can be very intrusive, but far more intrusive is a complete log of your physical **movement** .''

But companies looking to gain business from location **tracking** insist that the worst-case scenarios presented are impractical to implement in reality.

''There's...

... for Starbucks to monitor everyone's location on the off chance they can acquire a **customer** ,'' said Jason Devitt, chief executive of Vindigo, which offers 11 city guides through Palm organizers...

...it right the first time.''

In many ways, a person's whereabouts are already being **tracked** .

Employee security cards record when people enter buildings. Discount grocery programs **track** what people buy, where and when. Electronic toll-payment systems know when someone traverses a...

5/3,K/116 (Item 1 from file: 810)
DIALOG(R)File 810:Business Wire

0921126 BW1247

RADIANT SYSTEMS: Radiant Systems, Inc. And Interlott Technologies, Inc. First To Integrate POS And Lottery Ticket Dispensing Systems

October 13, 1998

Byline: Business Editors

...Interlott MVP secure lottery ticket dispensing system. This prototype interface is designed to help C **Store** retailers **track** and control lottery tickets while increasing ticket sales.
Eric Hinkle, Radiant Systems' President and Chief...

...first direct
connectivity to a smart lottery ticket device; a milestone for the Petroleum & C **store** industry."
The integration drives multiple benefits to C **store** operators,

including:
-- Total physical ticket security
-- Increased **customer** throughput (by moving lottery customers out of the POS area to make ticket selections)
-- Detailed ticket **movement** analysis, cashier **monitoring** and detailed reporting
-- Elimination of "cross-rings" and other ticket theft practices
-- Faster Shift changes...

5/3,K/117 (Item 1 from file: 813)
DIALOG(R)File 813:PR Newswire

1409324 LAM054
2000 Online Merchants Help Launch the Internet's Largest Self-Regulatory Online Privacy Program

DATE: January 25, 1999 09:03 EST WORD COUNT: 636

... view a Public Eye member's file to view the merchants privacy statement and privacy **track** record before executing a transaction.

"Our goal was to accelerate implementation of good privacy practices...

... Public Eye. "Moreover, the program is truly self regulating. Though privacy statement creation, publishing and **monitoring** are facilitated by Public Eye, compliance, assessment and resolution are completely in the hands of...

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... on the Internet but to serve as a catalyst to boost the fledgling privacy practices **movement** . Hopefully the Public Eye program will serve as a conduit to steer merchants toward more...

...end.

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5/3,K/118 (Item 2 from file: 813)
DIALOG(R)File 813:PR Newswire

0980510 NYM004
NPD's INTELECT PURCHASES Elrick & Lavidge's ELCAP

DATE: August 5, 1996 08:00 EDT WORD COUNT: 461

, Aug. 5 /PRNewswire/ -- INTELECT, a leading
supplier of retail sales **tracking** information for the **consumer**
electronics industry, has acquired the Elrick & Lavidge Computerized
Audit Program (ELCAP), which monitors the major...

...appliance
industry in the U.S. The purchase significantly broadens INTELECT's
coverage of the **consumer** durables industry, giving marketers a central
resource for **store** **movement** data across multiple categories.

"With the additon of the ELCAP business, we're able to offer
INTELECT clients complete coverage of the **consumer** electronics and
durables industry," commented Bill Lucas, president of NPD Syndicated
Services. "Since 1986 INTELECT has been the premier provider of **consumer**
electronics equipment such as TVs and stereos -- and on photographic
equipment, small domestic appliances, and...
...major domestic
appliance marketers a global resource. "Through our international
partner GfK, INTELECT was already **monitoring** major domestic appliances
in Europe and Asia," explained INTELECT Vice President, Clark Johnson.
"All subscribers...

...upcoming weeks."

About INTELECT

Formed in 1986, INTELECT is a leading provider of retail sales
tracking information for the **consumer** electronics and durables industry
in the U.S. and around the world. In addition to...
?

T S5/9/94

5/9/94 (Item 14 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00848549 **Image available**
METHOD AND APPARATUS FOR MONITORING THE EFFECTIVE VELOCITY OF ITEMS THROUGH A STORE OR WAREHOUSE
PROCEDE ET APPAREIL PERMETTANT DE SURVEILLER LE TAUX DE ROTATION EFFECTIF D'ARTICLES DANS UN MAGASIN OU UN ENTREPOT
Patent Applicant/Assignee:
THE PROCTER & GAMBLE COMPANY, One Procter & Gamble Plaza, Cincinnati, OH 45202, US, US (Residence), US (Nationality)
Inventor(s):
McCONNELL Theodore Van Fossen, 3009 Fairfield Avenue, Cincinnati, OH 45206, US,
VACCARO Henry Sebastian, 164 Monte Vista, Los Alamos, NM 87544, US,
Legal Representative:
REED T David (et al) (agent), The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217-1087, US,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200182170 A2-A3 20011101 (WO 0182170)
Application: WO 2001US11392 20010406 (PCT/WO US0111392)
Priority Application: US 2000195689 20000407; US 2000196039 20000407
Designated States:
(Protection type is "patent" unless otherwise stated - for applications

prior to 2004)
AE AG AL AM AT (utility model) AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ (utility model) CZ DE (utility model) DE DK (utility model) DK DM DZ EE (utility model) EE ES FI (utility model) FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK (utility model) SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Main International Patent Class: G06F-017/60
Publication Language: English
Filing Language: English
Fulltext Word Count: 27852

English Abstract
An item velocity **monitoring** system is provided which interfaces with a **consumer** retail **store** that has several cash registers that are tied into a "point of sale" **store** controller. The item velocity **monitoring** system is capable of detecting when sales (or other **movement** activities) of an item are occurring too quickly, or too slowly. The item velocity **monitoring** system is first "trained" in a learning mode of operations, during which item patterns and group patterns are evaluated and placed into a pattern database. The system then compares the observed item velocity to its model probability velocity, and if the observed item velocity deviates beyond the statistical model, a "velocity event" is generated, declaring one of the above selling "too quick" or "too slow" conditions.

French Abstract
La presente invention concerne un systeme de surveillance du taux de rotation d'article qui est en interface avec un magasin de detail qui possede plusieurs caisses enregistreuses reliees a un controleur de magasin <=point de vente>=. Ce systeme de surveillancede taux de rotation d'article est capable de detecter lorsque les ventes (ou d'autres activites de mouvement) d'un article surviennent trop vite ou trop lentement. Ce systeme de surveillance de taux de rotation est d'abord <=renseigne>= dans un mode d'apprentissage des operations, durant lesquelles des profils d'article et des groupes de profils sont evalues et places dans une base de donnees de profils. Puis le systeme compare le taux de rotation d'article avec son taux de rotation de son modele de probabilite, et si le taux observe sort du modele statistique, un <=evenement relatif au taux de rotation>= est genere, qui declare qu'une des ventes susmentionnees est <=trop rapide>= ou <= trop lente>=.

Legal Status (Type, Date, Text)
Publication 20011101 A2 Without international search report and to be republished upon receipt of that report.
Examination 20011213 Request for preliminary examination prior to end of 19th month from priority date
Search Rpt 20030828 Late publication of international search report
Republication 20030828 A3 With international search report.
Republication 20030828 A3 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Detailed Description
METHOD AND APPARATUS FOR MONITORING THE EFFECTIVE VELOCITY OF ITEMS THROUGH A STORE OR WAREHOUSE

TECHNICAL FIELD

The present invention relates generally to computerized item. stock monitoring equipment and, is particularly directed to a stock-out detector of the type which uses data provided by point-oPsale equipment, such as cash registers. The invention is specifically disclosed as an item velocity monitoring system. that analyzes point-of-sale 1 0 data for retail stores in real time to determine if items are being sold faster than expected or slower than expected, and which can also predict stock-outs in advance and make aecurate near-term sales forecasts for individual items at the store level.

BACKGROUND OF THE INVENTION

1 5

Retail stores, and their suppliers, normally decide how to stock inventory according to several methods, such as comparing the rate of sales to the current perpetual inventory for an item, and. forecasting, using any number of algorithms, when a stock out will oceur.

Reorder is then timed to the forecast stock-out such that a stock-out will not occur. This first method fails because either the perpetual inventory was incorrect---a frequent condition-or the sales pattem assumed by the forecasting was incorrect; also a frequent condition.

Another methodology involves performing periodic examination of shelves to see what is not in stock or near out-of-stock and. placing an order based on that condition. This second method fafis because the person checking the shelves did not observe a stock-out condition, was not able to identify it (for example, because the "hole" was filled vath another itenl--which often occurs in the retail industry), or did, not report it, or (inverted exclamation mark)t was reported but the proper action was not taken.

Stock-out conditions are generally considered undesirable by the retailer and by the 3 0 retailer's suppliers. The retailer does not like (inverted exclamation mark)t because (inverted exclamation mark)t lowers **customer** service levels (Le. their customers can't get what they want, and. therefore may not shop there again), and because in many cases people will not buy a substitute product, and the potential sale will be lost. Supply chain partners do not like stock-outs because of lost sales, and because of the disraption in the normal flow of goods, which causes increased order and shipping costs.

Because of the problems with maintaining aecurate perpetual inventory, stock-out conditions persist for up to 15% of all items in all stores on average. This constitutes at least a potential 15% efficiency gain opportunity across the retail goods trade. Moreover, improved stocking does not necessarily increase costs, so even a small improvernent can yield a relatively large increase in profits.

1 0

SUMMARY OF THE INVENTION

Accordingly, it is a primary advantage of the present invention to provide an item velocity **monitoring** system that typically interfaces with the **consumer** retail **store** data 1 5 warehouse or with individual **store** point-of-sale (POS) controllers, and which is capable of detecting when **movement** activities of items are oecurring abnonnally quickly or abnormally slowly.

lt is another advantage of the present invention to'provide an item velocity **monitoring** system that is first "trained" in a learning mode

of operations, during which item pattems and group pattems are evaluated and placed into a pattem database, then compares an observed item. velocity to its model probability velocity, and if the observed item velocity deviates beyond the statistical model, a `velocitY event` is generated.

lt is a ftu-ther advantage of the present invention to provide a "Loyalty Out-ofStock Systern" that detects when items for sale are out-of-stock (OOS), discovers the reasons for these "stock-outs," and determines how customers react to these stock-outs, by analyzing detailed data on individual item. purchase occasions, such as that produced by conventional point-of-sale (POS) systems, or by analyzing hourly or daily summaries of **store** item **movement** where the identity of individual purchase occasions is unavailable.

It is still a ftu-ther advantage of the present invention to create notification messages describing the detection of fast, slow, and OOS items, and to deliver these messages to appropriate operating personnel and to other computer systems.

2
It is a yet flirther advantage of the present invention to provide a 'Toyalty Out-ofStock Systern" that autornatically operates on data for one or more stores and models the expected item movernent rate for each item under varying time-of-day, day-of-week, price, promotion, season, holiday, and market conditions; autornatically detects items that are Moving abnonnally slowly, thereby identifying items that may be improperly displayed (e.g., behind another item on the shelf); autornatically provides early warning that an item may go OOS (out-of-stock) by detecting items with abnormally high movement; automatically detects and reports on items that are OOS at retail stores; automatically surnmarizes OOS events for the store and retail chain management, and for suppliers, thereby identifying items that are over-stocked (too few OOS events), under-stocked (too many events), badly re-stocked (too long events); autornatically analyzes the OOS events to find pattems that explain why OOS's are occurring; and automatically determining the impacts of these OOS events on store customers, thereby measuring losses to the retailer and supplier, and establishing the loyalty of consumers to the itern, brand, and chain.

5 Additional advantages and other novel features of the invention will be set forth in part in the description that follows and in part will become apparent to those skilled in the art upon examination of the following or may be leamed with the practice of the invention.

To achieve the foregoing and other advantages, and in aecordance with one aspect of the present invention, a method of using a computer processor to monitor items being received and disbursed within a predetennined environment is disclosed, in which a computer monitoring system is provided having a memory circuit for storage of data, a communications port, and a processing circuit; a plurality of sensing circuits or sensing devices are provided that detect at least one item as (inverted exclamation mark)t is moved to predetermined locations within the predetennined enviromnent; a probability pattem is detennined of a velocity of the item (in which tenn `velocity" as used herein refers to the frequency with which the item is observed) as it passes one of the plurality of sensing circuits, and the probability pattem is stored in the mernory circuit; using the communications port, identification characteristic infonnation is received pertaining to the item as it passes one 0 of the plurality of sensing circuits, and time of day

inforrnation is reccived corresponding to when the item was detected by the one of the plurality of sensing circuits; and an

3

observed velocity of the item passing one of said plurality of sensing circuits is compared to the probability pattern, after which (inverted exclamation mark)t is determined whether or not the observed velocity is anomalous, and if so generating a velocity event announcernent that the observed velocity is occurring too slowly, or oceurring too quickly.

In accordance with another aspect of the present invention, an item velocity monitoring system is provided, comprising: a plurality of sensing circuits that detect at least one item as it is moved to predetennined locations within a predetermined environinent; a computer monitoring system, having a memory circuit for storage of data (the memory circuit containing a quantity of random access memory (RAM) and a bulk memory storage device), a communications port that is effectively connected to at least one of the sensing circuits and to the mernory circuit, and a processing circuit that is configured to control the flow of data between the mernory circuit and the communications port; the processing circuit also being configured to: determine a probability pattem of a velocity of the item as it passes one of the plurality of sensing 1 5 circuits, and to store the probability pattem in the memory circuit; to receive identification characteristic inforination pertaining to the item as it passes one of the plurality of sensing circuits, and to receive time of day infonnation corresponding to when the item was detected by the one of the plurality of sensing circuits; and,to compare an observed velocity of the item passing one of the plurality of sensing circuits to the probability pattem, and to detennine whether or not the observed velocity is anornalous, and if so to generate a velocity event announcernent that the observed velocity is one of. (i) occurring too slowly, or (ii) occurring too quickly.

In accordance with a flirther aspect of the present invention, a method of using a computer processor to analyze velocity pattems of movernent of items being received and disbursed within a predetermined enviromnent is provided, comprising the steps of (a) providing a computer monitoring system having a memory circuit for storage of data, and a processing circuit; (b) receiving data pertaining to at least one transaction involving at least one item of inventory in the predetermined enviromnent; and (c) using a predetermined probability pattem of a velocity of the item, after the transaction detennining whether an observed velocity is one of. (i) occurring too slowly, or (ii) occurring too quickly.

4

In accordance with a yet another aspect of the present invention, a method of using a computer processor to analyze velocity pattems of movement of items being received and. disbursed within a predetennined environment is provided, said method comprising the steps of providing a computer monitoring system having a memory circuit for storage of data, and a processing circuit; and automatically training the computer monitoring system using either historical data or data gathered in substantially real time, thereby learning item velocities for a plurality of items.

. In accordance with yet a further aspect of the present invention, an item velocity monitoring system is provided having a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetennined environment; a computer monitoring system that comprises a mernory circuit for storage of data, and.

contains a quantity of random access memory (RAM) and a bulk memory storage device; a communications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and a processing circuit that is configured to control the flow of data between said memory circuit and said communications port; in which 'the processing circuit is also configured to receive data pertaining to at leas(inverted exclamation mark) one transaction involving at least one item of inventory in said predetermined environment; and to dynamically detennine probability pattem of a velocity of said at least one item, after said at least one transaction to determine whether an observed velocity is one of- (i) occurring too slowly, or (fi) occurring too quickly.

In accordance with still a further aspect of the present invention, an item velocity monitoring system is provided having a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined enviromnent; a computer monitoring system that comprises a mernory circuit for storage of data, and contains a quantity of random access mernory (RAM) and a bulk memory storage device; a communications port that is effectively connected to at least one of said sensing circuits and. to said memory circuit; and a processing circuit that is configured to control the flow of data between said memory circuit and said communications port; in which the processing circuit is also configured to automatically train said computer monitoring system using either historical data or data gathered in substantially real time, thereby learning item. velocities for a plurality of items.

5
In aceordance with yet another embodiment of the invention, a method and system for determining the cause of out-of-stock events is provided. 'The method includes receiving data pertaining to a transaction involving an item of inventory in a predetermined environment, determining that an out-of-stock event exists for the item. of inventory, and determining automatically the cause of the out-of-stock event. The method is capable of determining various causes of out-of-stock events including, but not limited to, store problems, retail outlet problems, price reductions, sale promotions and time of day/week/year causes.

Another embodiment of the present invention comprises a method and system for determining customer impact occasioned by an out-of-stock event. The method comprises identifying each of a plurality of customers, correlating current out-of-stock events to each. custorner's purchasing event, analyzing historical purchasing data,for each.
customer, estimating, for each customer, an expected purchase amount for at least one out-of-stock item. based on the historical purchasing data, and comparing, for each.

1 5 customer, the actual purchases during the customer's purchasing event relative to the estimated expected purchase amount for the at least one out-of-stock item. The method and system are capable of determining various impacts, including, but not limited to, substitution of another brand, substitution of the same brand, delaying the purchase and lost sales. In addition, the method and system can determine item loyalty, brand loyalty and store loyalty.

Still other advantages of the present invention will become apparent to those skilled in this art from the following description and drawings wherein there is described and shovm a preferred embodiment of this

invention in one of the best modes contemplated for carrying out the invention. As will be realized, the invention is capable of other different embodiments, and its several details are capable of modification in various, obvious aspects all without departing from. the invention. Accordingly, the drawings and descriptions will be regarded as illustrative in nature and not as restrictive.
6
BRIEF DESCRIPTION OF THE DRAWINGS
The accompany(inverted exclamation mark)ng drawings incorporated in and fonning a part of the specification illustrate several aspects of the present invention, and together with the description and claims serve to explain the principles of the invention. In the drawings.

Figure 1 is a block diagram of the major components of an item velocity monitoring system, as constructed according to the principles of the present invention.

Figure 2 is a flow chart of sorne of the major operations perfonned by the item velocity monitoring system of Figure 1, showing its Learning Mode and Detection Mode functions.

Figure 3 is a flow chart of some of the detailed logical and mathematical operations performed by the item velocity monitoring system of Figure 1, showing steps to create certain tables to create a Historical Transaction Database.

Figure 4 is a flow chart of some of the detailed logical and mathematical operations perfonned by the item velocity monitoring system of Figure 1, showing initial steps to train the OOS Detector.

Figure 5 is a flow chart of some of the detailed logical and mathematical operations perfonned by the item velocity monitoring system of Figure 1, showing intermediate steps to train the OOS Detector.

Figure 6 is a flow chart of some of the detailed logical and mathematical operations performed by the item velocity monitoring system of Figure 1, showing ftirther intennediate steps to train the OOS Detector.

Figure 7 is a flow chart of some of the detailed logical and mathematical operations perfonned by the item velocity monitoring system of Figure 1, showing yet further intermediate steps to train the OOS Detector.

Figure 8 is a flow chart of some of the detailed logical and mathematical operations perfonned by the item velocity monitoring system of Figure 1, showing final steps to train the OOS Detector.

Figure 9 is a flow chart of some of the detailed logical and mathematical operations performed by the item velocity monitoring system of Figure 1, showing steps to detect an OOS Event.
7
Figure 1 0 is a flow chart of some of the detailed logical and mathematical operations performed by the item velocity monitoring system of Figure 1, showing steps to compute OOS Event attributes; to read new POS data; to detect new OOS Events; and to tabulate event data.

Figure 1 1 {comprising Figures 1 1 (A) and 1 1 (B)} is a flow chart illustrating the operations performed by a method and apparatus according to one embodiment of the present invention which determines the cause of out-of-stock events.

Figure 12 is a flow chart illustrating the operations performed by a method and apparatus according to one embodiment of the present invention which determines **customer** impact occasioned by an out-of-stock event.

Figure 13 is a flow chart illustrating the operations performed by an alternative method and apparatus according to another embodiment of the present invention which detennines customer impact occasioned by an out-of-stock event.

Figure 14 is a block diagram of the major components of a preferred embodiment 5 of an item velocity monitoring system, showing both hardware components and major software functions, as constructed according to the principles of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT
Reference will now be made in detail to the present preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings, wherein like numerals indicate the same elements throughout the views.

In one aspect of the present invention, an item velocity monitoring system is provided which interfaces with a consumer retail store (e.g., a grocery **store**) that has several cash registers that are tied into a "point of sale" (P.O.S., or POS) **store** controller, or which interfaces to a data warehouse or other data storage system where current POS transaction data, or hourly or daily POS data summaries, are retained. The item velocity **monitoring** system includes a personal computer for most retail **store** applications, although larger computers or smaller modular computers couId be used, depending upon the quantity of real time data that is to be processed. A bulk memory device is typically provided to **store** data in real time, and a modem or LAN is provided to communicate
8
with the POS **store** controller, or the data warehouse or other POS data storage system, and with a centralized location where ftu-ther data analysis is aceomplished, and. perhaps with other remote **monitoring** devices.

The item velocity **monitoring** system is capable of detecting when sales (or other movement activities) of an item are occurring too quickly, or too slowly. Both. types of information are very usefal to the **store** manager, since an item that is moving too quickly (Le., with respect to its "expected" velocity of movement) could become out-ofstock before expected, and. farthermore an item that is moving too, slowly (Le., again with respect to its "expected" velocity of movement) could be an indication that the item.

is either out-of-stock in the **store** , or on the shelf, or some other reason that: prevents consumer access to the item.

lf an item does not move for a designated amount of time, the item velocity **monitoring** system, will determine the current price of the item from. an Item Table stored on the POS controller, or if not available, from the most recent price observed in the transaction data for the item, or in the most recent hourly or daily surnmary data for the item.. One embodiment of the present invention uses this price and a stored itera movement probability distribution model for the item. and. price, together with the **store** 's current sales velocity for either all items combined, or only those item in the same category, depending on which produces more accurate results, to detect items that are moving

teio slowly or are out-of-stock (OOS), witbout having to wait for the item to appear in a new transaction.

The item velocity **monitoring** system is first "trained" in a learning mode of operations, during which item pattems and. group pattems are evaluated and placed into a pattem database. The system then compares the observed item. velocity to its model probability velocity (Le., essentially its "expected" velocity), and if the observed item velocity deviates from the statistical model, a "velocity event` is generated, declaring one of the above selling "too quick` or "too slow" conditions. The detafis of the training and probability analysis of the item velocities are incorporated in a "Loyalty Out-of-Stock System," which is described below.

Once a velocity event is detected, an event handling routine displays the event, and.
perhaps alerts the **store** manager (for more critical events), and ftirther can transmit the
9
event information over a network (including the INTERNET) to a remote computer for additional analysis or record keeping.

Another aspect of the present invention is referred herein as a 'Loyalty Out-ofStock System," or "LOSS,` which is incorporated in the above item. velocity **monitoring** system. This LOSS aspect of the invention is a computerized item stock-out detection and analysis system. LOSS detects when items for sale are out-of-stock (OOS), discovers the reasons for these `stock-outs,` and determines how customers react to these stock-outs. It does this by analyzing detailed data on individual item purchase occasions, such as that produced by conventional point-of-sale (POS) systems, which can be found in many stores.

1 0 Some of the many flmctions that are performed by the LOSS include.

(1) automatically operating on data for one or more stores, handling thousands of individual items in each store, and modeling the expected item movement rate for each item under vary(inverted exclamation mark)ng time-of-day, day-of-week, price, promotion, season, holiday, and market conditions;
1 5 (2) automatically detecting items that are moving abnonnally slowly, thereby identify(inverted exclamation mark)ng items that may be improperly displayed (e. g., behind another item on the shelf); (3) automatically providing early warning that an item may go OOS (also referred to.herein
as an `OOS event") by detecting items with abnormally high **movement** ;
(4) automatically detecting and reporting on items that are 00 S at retail stores; (5) automatically surmnarizing OOS events for the store and retail chain management, and for suppliers, thereby identify(inverted exclamation mark)ng items that are over-stocked (too few OOS events), under
stocked (too many events), badly re-stocked (too long events);
(6) automatically analyzing the OOS events to fmd pattems that explain why OOS's are occurring; and (7) automatically determining the impacts of these OOS events on store customers, thereby measuring losses to the retailer and supplier, and establishing the loyalty of consumers to the item, brand, and chain.

Conventional inventory control systems do not perform these ftmctions. In fact, for some retail operations, especially grocery stores, existing systems are unsuited to perfonningthesefunctions.

TheLOSSofthepresentinventionhelpstoeliminatebothoutof-stocks as well as over-stocks, which most conventional systems do not attempt to do.

1 0
The LOSS aspect of the present invention is a system for automatically detecting time periods during which an item for sale is not in stock and automatically analyzing the Hkely causes and impacts of these out-of-stocks (OOS's). This `OOS detection and analysis systern" aspect of the present invention uses detailed transaction level, or hourly or daily sununary level, point-of-sale (POS) data from one or more stores for a retailer to train the system. so that it can detect OOS events. Henceforth, when the POS data is referenced, (inverted exclamation mark)t is to be understood that this means either data for individual POS transactions, or for hourly or daily sununaries of **movement** for individual items in each **store** , and that.

references to communicating with a POS controller may also mean communicating with 0 a data warehouse or other data storage system that holds POS data. Detafis on the data content are described hereinbelow.

Referring now to the drawings, Figure 1 shows the general layout of a grocery **store** or other type of **consumer** retail□store□that has several cash registers that are tied into a `point of sale" (P.O.S., or POS) **store** controller. In addition to the standard cash 5 registers and POS **store** controller, an item velocity **monitoring** system is provided, generally designated by the reference numeral 10. ltem velocity nionitoring system 10 includes a personal computer generally designated by the reference numeral 20, although reference numeral 20 could instead represent a mainframe computer used for very large data quantity applications, or in certain other applications, the personal computer 20 could be reduced to a module with only one or two main integrated circuit chips. It will, be understood that item velocity **monitoring** system 10 incorporates the Loyalty Out-ofStock System, (Le., LOSS).

Personal computer 20 in the illustrated embodiment of Figure 1 includes a central
processing unit at 22, which typically would consist of a microcomputer, mieroprocessor, or microcontroller. For many applications, a standard microprocessor will suffice for the CPU 22. The CPU 22 is in communication with a standard computer memory, including a non-volatile memory at 24. Furthermore, the CPU would typicallybe in communication with a keyboard and/or mouse at 26, and a video monitor at 28.

Naturally, the video monitor 28 could be a CRT-type technology, or it could be a flat panel display, if desired.

1 1
The CPU 22 of personal computer 20 will preferably also be connected to some input-output circuits, such as those that may be found on a PCI card, generally designated by the reference numeral 30. The outputs of such an I/0 circuit 30 could be used to drive an alann in the store manager's office, generally designated by the reference numeral 40, along an electrical circuit 42.

CPU 22 will also preferably be connected to a modem or network card, generally designated by the reference numeral 32 on Figure 1. This modem or network card at 32 will preferably be connected via a communication link 62 to a point-of-sale (POS) store controller generally designated by the reference numeral 60. In addition, the modem/network port 32 could be connected to an INTERNET service provider (ISP) at 50 via a network line

or telephone line at 52. This ISP 50 would then be connected to the INTERNET, which is generally designated by the reference numeral 54 on Figure 1.

The POS store controller 60 is typically in direct communication with a plurality of cash registers, such as cash registers 70, 72, and 74 on Figure 1 (also referred to herein as "point-of-sale registers"). Naturally, the larger the store, the more cash registers there typically would be, and cach of these cash registers would be connected into the POS store controller 60 in normal installations. Each of the cash registers 70, 72, and 74 will typically be connected to a sensing circuit or sensing device to detect items at the transaction point (Le., in a retail store setting, at the "poinC of sale). In most retail stores today, the cash registers are typically supplied with a bar code reader to determine the item's SKU designation. In future systems, however, other types of sensing circuits could instead be utilized, such as RF detectors to detect an RF tag (to count items), or perhaps RFID readers to not only note the movement of the item, but also to identify the item without literally aiming a light beam and without making any physical contact with the item. Of course, other types of sensors will eventually be developed for retail stores, warehouses, or distribution points, and will be useful for supplying information in conjunction with the present invention.

It will be understood that the terminology '(inverted exclamation mark)tem velocity` or merely "velocitY" as used herein refers to a frequency (or rate) at which items (such as goods for sale in retail stores) move throughout a predetennined enviromnent (such as a retail store). In general, the "velocity" is a frequency at which a particular type of item, or particular
12
groups of types of items, is sold or shipped. More specifically, in the present invention item velocity (or `velocity") is a measure of the quantity of certain items as they pass a sensing circuit over a particular time period (or "money" period, as will be explained hereinbelow), and the velocity can be a measure of the frequency of item movement as items are received at a receiving dock, a measure of the frequency of item movement as items are shipped at a shipping dock (or a combination thereof), and/or a measure of the frequeney of item movement as items are sold at a point-of-sale device (such as a cash register). The "raw data" that indicates an item's presence at one of the sensing circuits typically includes a time stamp, perhaps an item quantity, and some type of identifying indicia, such as an SKU designation or a bar code label, which is typically detected by a bar code reader (using today's technology).

As used hereinbelow, the tenninology "inter-arrival time" refers to the number of time units or monetary units that pass between observations of an item of quantity one (1) or more as (inverted exclamation mark)t is being detected at one of the sensors/detectors. Therefore, "velocity" is equal to: {inter-arrival time * item quantity -- time/monetary units}. When monetary units are used, they refer to an aggregate or summation across either all types of items (e.g., SKU's),., or only those items in a predefined group (e.g., a product brand, or a product category).

In non-retail store settings, such as warehouses or product distribution points, a POS controller would usually not be appropriate, at least not with respect to interfacing directly with consumers. Instead of a POS store controfier 60 and a series of cash registers (e.g., cash register 70), these altemative settings could use bar code readers (for example)

at a shipping dock and/or a receiving dock to monitor the velocity of item movements in and out of the facility. On Figure 1, a receiving dock bar code reader, generally designated by the reference numeral 80, is provided and a shipping dock bar code reader, generally designated by the reference numeral 82, is provided. These bar code readers are not connected to a POS store controller (particularly since this site will not likely contain a POS store controller), but instead can be in direct communication with the item. velocity monitoring system 10 via a direct connection (at 84 and 86, respectively), or via a LAN or other network. Bar code reader 80 would be used to scan items as they are received at the warehouse/distribution point, and these items could be labeled on their packing cartons, or some type of bill of lading or other invoice
1 3
documentation. In addition, or altematively, individual items as they are unpacked from shipping cartons could be scanned in at the receiving dock, in which case the item's SKU in real time. For example, the present invention can detect when items have become outof-Stock, and when they have been restocked.

Figure 2 is a flow chart that shows some of the important logical operations that are performed by the item velocity monitoring system 1 0 of the present invention. 1f the velocity monitoring system 1 0 is newly installed into a.particular store, then (inverted exclamation mark)t must first undergo a learning process. This begins at a function block 100 that is titled the "Leaming Mode.' The first stepi at 102 is to receive point-oPsale data, which will include the time of day, the item description, and its SKU designation. It will be understood that the SKU designation for a particular item is an industry standard piece of 1 0 infonnation, however, any type of numeric or alphanumeric information could be used to identify individual items or groups of items for use with the present invention, without departing from the principles of the present invention.

The next step at 104 is for the system to evaluate and "learn" item pattems and group pattems. As noted above, these item pattems or group pattems are generally 1 5 statistical models for sales and velocity of those items or groups under varying conditions of price, time of day, season, promotion, and competitive activities. After items have pattems created for them at step 104, all of the pattems at a step 106 are placed into a pattem database. This would typically involve the CPU 22 of personal computer 20 storing data into the non-volatile memory 24.

lt will be understood that non-volatile memory 24 will typically consist of a bulk.

memory storage device, such as a magnetic hard disk drive using present technology, although for very large systems this could include a read/write optical mernory system to store large quantities of data. Of course, in the future even greater data density storage devices will become available, and it may be possible at some day in the not too distant future for a non-volatile memory to be able to store CD-ROM amounts of data on a single non-moving integrated circuit device.

In addition to the above, it will ftirther be understood that the CPU 22 will typically read and write data using standard volatile memory that will consist of Random Access Memory, which could comprise dynamic RAM chips, or as in most modem personal computers, SDRAM (Synchronous Dynamic RAM) integrated circuits. There may be a technology in the future that eliminates the need for fast Random Access
15

Memory if and when. a certain type of non-volatile memory device is available that has sufficient speed to keep up with the processing circuit. While this may never occur, the principles of the present invention can be utilized with any type of processing circuit and memory circuit. The need for a non-volatile memory is generally established by the fact that data typically should be preserved when power is shut down for the computer itself, and moreover, most large capacity data storage devices are also non-volatile in nature.

Once all of the pattems have been placed into the pattem database at step 106, the item velocity monitoring system 1 0 is capable of entering its nonnal operating mode, also referred to as its `Detection Mode" which is indicated by the reference numeral 120 1 0 on Figure 2. Once in the Detection Mode, the first step at 122 is again to receive pointof-sale data, including time of day, item description, and. the (inverted exclamation mark)tem's SKU designation. In step 122, this point-of-sale data is typically generated in real time by the cash registers 70, 72, and 74, for example. Furthennore, any information from the receiving dock bar code reader 80 or shipping dock bar code reader 82 will also be received in real time at step 122. For the purposes of the present invention, the most important data being reccived is generally the data from the cash registers with regard to analyzing velocity pattems of the items or groups of items that are being sold or otherw(inverted exclamation mark)se disbursed througliout the store.

The above analysis procedure occurs at a step 124, where the point-of-sale data is analyzed by comparing the observed velocity of each item or group to its "model probability velocity,` which is stored in the pattem database. It should be noted that this comparison should take into account the current operating conditions. These current operating conditions may include the item price, time of day, day of week, date of year or season, whether or not any promotional displays or "on sale" activities are occurring, and finihermore whether or not there are any particular competitive activities occurring.

All of this different infonnation is included in the model probability velocitY for cach item or groupi that is stored in the pattem database of the non-volatile memory 24.

After analyzing the point-of-sale data at step 124, a decision step 126 determines whether or not the current transaction is for a `new` item. The item velocity monitoring system 10 needs to recognize the SKU designation of an (inverted exclamation mark)tem. as (inverted exclamation mark)t passes the point~ofsale sensor or bar code reader, and if (inverted exclamation mark)t cannot recognize a particular designation as
16
having bcen one that has been seen before, then it must conclude that the transaction is for an item that is being detected for the first time at this store (at least, within the experience of the item velocity monitoring system 10). If the answer at decision step 126 is YES, then a step 128 @generates a `new itern" event. The logic flow then is directed to a step 130, which is an event handling routine. Several optional things can oceur within the event handling routine 130, including displaying the event on the video monitor 28, storing the event in the database in non-volatile memory 24, alerting the store manager (perhaps by use of the alarm 40 in the store manager's office), or transmitting the event to a network using the modem/network card 32, or transmitting a message describing the event to a pager or a wireless handheld device such as those routinely used by inventory restocking personnel.

It will be understood that the type of network that data is communicated to over the LAN or network card 32 can be one of several different types of networks. This includes Local Area Networks (LAN's), Wide Area Networks (WAN's), intranets, or the INTERNET. Other proprietary networks certainly could also be used without departing from the principles of the present invention. This would include such networks as a WINDOWS 95 network, or an ETHERNET network.

If the result at decision step 126 was NO, then a decision step 140 determines whether or not the item that has just been observed is behaving within its expected deviation tolerance from its statistical pattern. This statistical pattem is also referred to herein as the item's "model probability velocity." Step 140 is in many ways the critical step for making a useful system. that can operate as an item velocity monitoring system.

The determination as to whether or not an itern's current transaction is within its expected deviation from the statistical pattem is a very difficult determination to make without sophisticated functionality, such as provided by a computer program that is constructed aecording to the principles of the present invention.

lt may not be particularly difficult to determine a model probability velocitY pattem for certain types of transactions, but (inverted exclamation mark)t becomes much more complex when conditions that may vary are included in the analysis and statistical model. These varying conditions can include (as noted above) the price, time of day, day of week, season or date of year, promotional activities, and competitive activities. lt is important
1 7
to analyze all of this information so as to not generate alanus when they are not necessary. Further detafis of how this is accomplished are provided hereinbelow.

If the result is YES at decision step 140, then all is well with respect to the particular item that was just: transacted at a cash register, for example, and the logic flow is directed back to the beginning of the detection mode at step 122, where point-of-sale data can be received for the next transaction. On the other hand, if the result at decision step 140 was NO, then the logic flow is directed to a step 142 that generates a velocity event.

At step 142, there are three main types of velocity events that can be annunciated or "announced" by the (inverted exclamation mark)tem. velocity monitoring system 10 of the present invention.
Three very important conditions can be determined, as follows: (1) an item is selling `to0 slow;` (2) an item is selling "too fast;" or (3) an out-of-stock condition is declared by the item velocity monitoring system 10. In the case of any of these velocity events, the logic flow is directed to the event handling routine 130, where the particular event can be dispilayed, stored in the database, transmitted to a network, including the INTERNET, or can be used to create an alert or alann for the store manager (or sent to a display in the store manager's office).

One major advantage of the present invention is that (inverted exclamation mark)t can operate in real time or near real time. Since the item velocity monitoring system 10 accumulates data from the point-of-sale store controller 60, that data can be presented almost (inverted exclamation mark)mmediately after a transaction has been

recorded by one of the cash registers that are in communication with the point-of-sale store controller 60. In many typical installations, the point-of-sale store controller 60 is designated to transmit its accumulated data on a periodic basis, such as once per minute. Of course, (inverted exclamation mark)t is also possible for the POS store controller 60 to be designed to transmit its accurnulated data in batch format, with periodic batch accumulations occurring on a predetermined or random schedule (e.g., hourly, twicedaily, daily, weekly, monthly, etc.). However, newer point-of-sale store controllers are able to transfer data out virtually as soon as that data is received from any one of the plurality of cash registers that are connected into that POS store controller. In any of the above-described situations, the item velocity monitoring system 10 is capable of receiving the data, whether (inverted exclamation mark)t is in cumulative packets at particular time intervals, or

18

whether each individual transaction is communicated in an individual data packet from the POS store controller 60 to the item velocity monitoring system 1 0.

The item velocity monitoring, system 1 0 is capable of calculating the probability of observing zero sales of an item over a particular time interval since the last observed sale of that same item, given the current price of the item from an Item Table, or an estimate made by examining recent prices for the item, and given the total store or category sales over that time interval. If information is available about current and past promotions for this item, the item velocity monitoring system will use this as well in building the model probability velocity. . This probability of observing zero sales of an item will be one of the datum points of the model probability velocity statistical pattem stored in the pattem database.

lf the probability of observing zero sales over a particular time interval is very low, then in the actual event of a zero sales condition, this particular item is probably not available on the shelf of the store. In other words, an out-of-stock condition has occurred (at the shelf). This, of course, is one of the velocity events that can be generated at step 142. Before declaring the "shelf' out-of-stock condition, however, the present invention takes into aecount all of the important factors when it computes the probability as described above.

Some of the important factors regarding an out-of-stock condition includes: the normal selling rate for the item in a particular store, as adjusted for past out-of-stock conditions; the effect of its current price and promotions; the effect of store and/or category traffic; the effect of competition in the. regional market; and the effect of timeof~day, day-of-week, and week-of-year. As noted above, these factors are all parameters in the statistical model of the probability velocity for the arrival of particular items at the transaction points, such as the point-of-sale cash registers.

The statistical model of the present invention incorporates the above factors to calculate both the median sales rate (50 percentile), and the variability in this sales rate (as a variance), and from this information calculates the probability of zero sales over a particular time interval. These logical and mathematical decisions are described in greater detail in reference to a flow chart on Figure 9.

19

Since all factors are derived automatically from po'int-of-sale data when

the item velocity monitoring system 10 is in its Leaming Mode 100 (of the flow chart of Figure 2), there are no pre-defined factors or levels in the statistical model that will be necessary for (inverted exclamation mark)t to learn. Instead, the statistical model is utilized to build up information from the behavior of a particular store, and this occurs automatically while in the Learning Mode.

Once the item, velocity.monitoring system 10 is put into its Detection Mode of operation, then the analysis steps generally do not wait to flag or annunciate problems, but provide the information in real time or near real time (Le., substantially real time), essentially as soon as (inverted exclamation mark)t comes to the conclusion that an item has become out-of-stock. Thus, stock0 outs are detected automatically for any (inverted exclamation mark)tem for which historical point-of-sale data is available. Of course, if the (inverted exclamation mark)tem. is a "new" item, then the item velocity monitoring system 10 needs to learn more about that item before it can create a statistical model or pattem for that particular item.

In effect, the system can simultaneously operate both its Leaming Mode and
Detection Mode, using a multitasking processing scheme. Using both modes simultaneously allows the system 10 to refine its statistical model for an item while also being used in'operation to monitor the velocity of that same item. Of course, a parallel processing architecture could also be implemented to operate the CPU 22 of the present invention, or (inverted exclamation mark)t may even be possible to use a logic state machine to handle some of these operations.

The item. velocity monitoring system 10 of the present invention will preferably also aceumulate data and provide an "expected selling rate" for a period of twenty-four hours and forty-eight hours, to produce accurate sales forecasts for the next two days, for example. In general, the item velocity monitoring system 10 does not necessarily attempt to directly forecast inventory or replenishment levels, but it is able to feed data and statistical pattem information into other systems that perfonn inventory control and inventory forecast and replenishment operations. Of course, such computer prograrnining operations could all be combined into a single system, although the data provided by the item velocity **monitoring** system 1 0 of the present invention is really the critical information needed with respect to being able to analyze the situation in real
20
time. This is something that conventional inventory control systems are just not capable of doing.

The item velocity monitoring system 10 of the present invention tracks recent sales and compares them to what was expected by use of the statistical model probability velocity. Since an item that is selling far too fast or too slowly can be detected, this information is reported so that the retailer can be informed of any potential problems.

When an item is selling much more quickly than expected, then of course this item could become out-of-stock on the **store** shelf much more rapidly than would nonnally be expected. The **store** manager, once alerted to the situation, could then take steps to replenish the shelves with ftirther items that are stored back in the storage rooms of the **store** . Of course, if stock is low or already depleted in the storage rooms, then the **store** manager has a new problem and needs to order more of these items as soon as possible.

On the other hand, if an item. is selling much more slowly than would be expected, this could mean that the item is literally missing from the shelf, even though there are plenty of these items sornewhere else in the **store** . They could be on a different shelf which could be either a sales shelf or an incorrect shelf altogether, or they could be all in the **store** room or on a cart sorneplace where they are not in a condition for a consumer to purchase the item. None of these conditions are desirable, and again the item velocity **monitoring** system 1 0 of the present invention can notify the **store** manager of such an event so that the **store** manager can take corrective action in real time. It might be simply a matter of moving the items to their proper shelf, or unblocking some type of obstructions that are in front of this particular (inverted exclamation mark)tem's shelf space.

In a preferred mode of operation, the item velocity **monitoring** system uses a modified Poisson statistical model in which arrivals of items at the transaction points occur at random time intervals. In this statistical model, the probability that such a time interval will be at least "t" units long is equal to P(t>T), or expressed another way, as e @-t (e - lambda*) time units. In the preferred embodiment, time can be expressed in **store** sales (Le., in cumulative amounts of dollars being transacted since the previous observation of the item) rather than using actual clock time. For example, one would expect greater sales activity (or velocity of item movement) at noon on a Saturday than at midnight on a Sunday, and the incremental total **store** income (in dollars) can be used as
21
substitute "time" intervals to more accurately portray and analyze the activity. The value of lambda (@,) is a function of the factors listed above, as explained in greater detail below. The details of this statistical model are provided hereinbelow.

Other adjustments to these statistical models include compensation for the fact that items being sold in a **store** often arrive at the point-of-sale cash registers in clumps because a consumer will buy several units of the sarne item in a single trip to the **store** .

This wouId, of course, need to be taken into account for an accurate item velocity **monitoring** system that will not cause unnecessary alanns or "velocity event? as defined in the present invention.
The above adjustment (or "compensation") is accomplished by counting transactions (**shopping** baskets, in the case of a supermarket application) containing the item, rather than simply the item count, as observations, and measuring the time (in monetary units) between observations. Once this adjustment is made-together with the price, seasonal, promotional, or other adjustments discussed previously-the inter-arrival 5 times, in the absence of OOS events, f1t the Poisson model well. The present invention removes the effects of historical OOS events through an iterative process in which the model is trained, then (inverted exclamation mark)t detects OOS events, then (inverted exclamation mark)t removes these OOS event from the history, and then (inverted exclamation mark)t retrains, etc. Throughout this process, the use of the more stable sample median, in addition to the sample mean, greatly reduces the distortion caused by and residual historical OOS effects.

OOSEVENTS
One type of velocity event is an `OOS Event," which is a time interval for a specific (inverted exclamation mark)teni in a specific store during

which the item appears to be out of stock. Once the LOSS is trained, (inverted exclamation mark)t detects OOS events for individual items in each store and creates a database of these OOS events. This database is subsequently analyzed by LOSS to sununarize events, determine their causes, and measure their impacts. Some of the important attributes of an OOS event are used as described below to find pattems that help in understanding OOS's. There attributes include the following event descriptors.

Probability that item is actually OOS;
Item Number;
22
Store Number;
Time and date of last sale;
Time and date of next sale after OOS (if any);
OOS start time and date (acc0unts for expected time elapsed between sales); OOS end time and date (accounts for expected time elapsed between sales);
Average price prior to OOS;
Average price after OOS;
Promotions in effect going into OOS (on ads, temporary price reduction, end aisle
display, mark down, shopper card discount, etc.);
1 0 Expected item velocity during OOS;
Current pricing and. promotion adjustment to expected item velocity;
Actual average velocity prior to OOS;
Actual average velocity after OOS;
Lost selling time;
Total store sales during OOS;
Total category sales during OOS;
Lost sales of item;
Units sold since last stock out;
Units sold in last 24 hours;
Units sold in last 7 days; and
Units sold since last restock date (requires information on normal or actual restock dates for each item or category).

These above attributes may be computed for an individual OOS event or for a collection of OOS events, such as all the OOS events for a specific item. All detected OOS events are stored in a memory-mapped, binary flat-file format for subsequent analysis, referred to herein as the "OOS Events Database." This simple database preferably is maintained in order by store and time. The OOS events database, and all subsequent additions to it, preferably is automatically transmitted to a central location for fluther analysis. This occurs after initial training, then several times per day (for updates) thereafter.
23
OOS EVENT DETECTION ROUTINE
The LOSS of the present invention detects an `OOS EvenC by calculating the probability of observing zero sales of an item since the last observed sale of that item (as discussed hereinabove, as part of the `(inverted exclamation mark)tem velocity monitoring system"). When this probability is very low, then this item is probably not available. In other words, an out-ofstock condition has occurred. The invention takes into account all the important factors when it computes the probability describe above. These factors are all parameters to a statistical model for arrivals of the item at any transaction points (such as POS registers 1 0 within a supermarket). The model incorporates these factors to calculate the probability distribution for the `fime" between sales of the item, referred to herein as the `inter-arrival

titne."
For retail store applications of the LOSS of the present invention, "time" is preferably measured in units of "sales` rather than actual time intervals (such as minutes or 1 5 seconds). This will not be true in all applications, and for warehouses or manufacturer's distribution facilities, it may be that actual time is the preferred measurement criteria. In retail store facilities, one penny ($0.0 1) of store sales is used as a single time unit. For most (inverted exclamation mark)tems, this time unit is based on total store sales. For others, such as fresh milk produets, the time unit is total fresh milk category sales. These distinctions can be very important for correctly analyzing situations before "announcing` that an OOS event has occurred.

The decision on whether to use clock time or sales to represent "time" can be made by training the OOS detector once using sales information, and again using clock time infonnation. Then the first or second detector is chosen by comparing the residual errors in the predicted versus actual velocity models. The one with the smaller sum of errors should be used. The residuals can be calculated by subtracting the actual arrivals per unit "time" from the expected number, which is Mase Lambda" x "Adjustment Alpha". Altematively, simply use the sales based representation of time for any retail operation, and use the clock time version for other types of operations.

From the probability distribution for the inter-arrival time and the probability distribution of the number of units sold at each arrival, the LOSS calculates the median arrival rate (50u1 percentile), the expected arrival rate (mean), the variability in this
24
arrivals rate (variance), and the probability of zero arrivals in any observed time interval.

The model calculates and saves for later use the mean item quantity per observation (Beta) for each. item at various prices and prornotions for either specific stores, or for groups of similar stores. This infonnation enables the LOSS to estimate lost sales from the modeled inter-arrival times and the actual inter-arrival times. Beta is used as the mean of a Log-Normal probability distribution for the quantity of the item per arrival (thatis,pertransactioncontainingtheitem).
ThisinforniationisusedincreatingaLOSS statistical model, as discussed hereinabove. All model factors (parameters) are determined by the LOSS during its training phase, and revised as it retrains on new data. These model 0 factors include.

Normal selling rate for the item in a particular store, adj usted for past out-of-stocks;
Effect of the item's current price and promotions;
Effect of competing items' current price and promotions (a competing item preferably is one in the sarne "sub-category`, or "category" if sub5 category is not available, which has an opposite effect on the item when its sales go up or down);
Effect of store and/or category traffic;
Effect of competition in the regional market;
Effect of tirne-of-day, day-of-week, and season-of-year (or week-of-year); and Effect of holidays.

In the preferred mode of operating the LOS S of the present invention, all factors are derived automatically by the invention from POS data, so that there are almost no predefined factors or levels in the model. Instead, it learns these parameter values from the historical and new

data on behavior of cach item in a particular store or group of stores by undergoing a training phase (e.g., the Learning Mode 100 on Figure 1) that gathers the pertinent infonnation autornatically from the data. This data can be gathered in real time, if desired, which is a feature that has not been available in conventional store inventory control systems.

Afier the initial training phase, the LOSS detects OOS events in the historical training data and stores them in its OOS event database (in non-volatile or bulk memory
25
device 24, for example). When running in near real-time mode processing new data, the routine does not wa(inverted exclamation mark)t to flag problems, but gives the infonnation in near real-time (e.g., once per minute). Thus, new stock-outs are detected and stored in the database automatically for any item as soon as the LOSS thinks the item is OOS (out of stock). As noted hereinabove, the deterinination of an out of stock condition does not necessarily mean that the individual store is actually completely out of stock for a particular item, but will usually indicate that the particular item is not presently on the shelf, or its availability is somehow restricted even though it currently is located correctly.

The sales of each item in each store are modeled as a "renewal-rewar& process.

1 0 The preferred underlying renewal process is a modified Poisson model that describes the time between observed purchases of the item, as discussed below. The Reward process is a Log-Normal distribution that describes the number of items purchased at each purchase instance (also as discussed below).

1 5 MODIFIED POISSON STATISTIC MODEL
The preferred item inter-arrival time model for the LOSS is a modified Poisson statistical model in which inter-arrival times (of items at the transaction point) are stochastic. (That is, the length of the inter-arrival interval varies, and is governed by a probability distribution.) The probability behaves according to the familiar Poisson distribution, with important adjustments. For the classical Poisson Distribution, the probability that the inter-arrival time (t) is greater than T is given by the following equation.

P(t > T) = e - T (time units).

In the modified statistical model, time is expressed in store sales or category sales (rather than clock time) and lambda ( ) is a function of the other model factors listed above, such that the effective lambda is equal to Tase Lambda" x "Adjustment Alpha. ` Lambda's for all items are stored in two tables: a Mase Lambda table," and an "Adjustment Alpha table." The lambda used in the modified Poisson model is the Base Lambda times the 3 0 Adjustment Alpha. Both the Base Lambda and Adjustment Alpha tables contam' entries that are indexed by item number. The lambda table is also indexed by store. The alpha
26
table is further indexed by various values of price, promotion, competitive item promotions, season and other effects that change the "normaP velocity of an item.

Each item in each. store has its own entry in the lambda table. However, when there is insufficient data to refiably calculate a value, the training process bases the value of lambda on a combination of the

average value across all. stores, and the average value across all substitutes. Substitutes are items in the same sub-category or category of similar unit price and size.

Adjustments to Base Lambda for price, promotion, competitive (inverted exclamation mark)tem promotions, season, and other effects are calculated during training, and updated during re-training, then 0 stored in the alpha adjustment table. These adjustrnents are indexed by item and effect.

The different effects are listed above as a portion of the model factors. The alphas are calculated through a routine that first computes observed deviations from the Base Lambda under various conditions. Each. of these deviations is an observation. These are split into different samples aecording to the underlying condition sets (effects). A KoImogorov5 Smirnov (K-S) statistical test is applied to pairs of these samples to decide whether the paired-sainples should be combined. The K-S test is applied to the observed deviations in the two samples. Whenever the K-S test yields a low probability that the actual difference between two samples wouId have oecurred if they had the same underlying distribution of deviations, the samples are kept separate. 0therw(inverted exclamation mark)se, the samples are combined to become a new, larger sample. This process continues until no flirther aggregation occurs. For each remaining sample, the sample mean and variance of the deviations from the Base Lambdas are retained as the mean and variance of alpha, for all the condition sets represented by the sample.

Other adjustments to the preferred statistical model compensate for the fact that items selling in a store often arrive in clumps (because a customer will buy several units of the item in a single trip to the store). The expected quantity sold (referred to herein as the Meta mean"), and, variance in quantity sold (referred to herein as the Meta variance'% per checkouttransaction is stored in a Teta Table," indexed by item., and effect.

In the preferred mode of the present invention, when a table is indexed by one of more effects, the following conventions are used.

Trice Index" - This is the current price in cents.

27

Tromotion lndex" - This is a Boolean character string of length six (6} in which a 1 " in position n means that the n-th promotion type applied to the item, sale, and a "O" means that (inverted exclamation mark)t did not. For example, the default promotion types are as follows: string portion I-Shopper Card Discount, string portion 2--On Ad, string portion 3--On Display, string portion 4-Temporary Price Reduction, string portion 5-Markdown, string portion 6-Undefined.

`Day-of-Week Index" - This is a day, numbered from 1 to 7 (Sunday).

"Competing Item Promotion Index` - This is a Boolean value for which a value of `O` means that there is no competing item being promoted in the store, and a value of 1 0 ` 1 " means that there is a competing item being promoted in the store.

'Tirne-of-Day Index" - This is one of at most five (5) times of the day (Le., time intervals), as defined when the system. is installed. (For example, `23:00 to 5:30% '330 to
8:3 0% etc.)

"Holiday Index" - This is one of at most six (6) holidays, plus "none,` as defined when the system. is installed. (For example, `Christmas," "New Year," Master,`
'7hanksgiving," "Super Bowl," or Tourth of July.")
"Season Index" - This is one of at most four (4) seasons defined for the location when. the system is installed.

"Market Conditions Index" - This is the ratio of the lowest competing price for the item within the store's market arca to the current price of the item, rounded to the nearest 1 0 percent (1 0%).

As noted above, the Reward process is a Log-Normal distribution that describes the number of items purchased at each arrival (purchase instance). This Log-Normal.

distribution is used to model the quantity sold each time the sale of an item. oceurs. lt is a fimction of item, store, and various other effects. The parameters to the log-nonnal distribution, mean and variance, are obtained from the Beta Table, discussed above.

The preferred LOSS of the present invention can generate shorkerm item sales forecasts. The expected selling rate from the model (Base Lambda times alpha times beta) is also summed over the next 24 and 48 hours to produce accurate sales forecasts for the
28
next two days. These forecasts assume that there will be no changes in price, promotion, etc. during the 1-2 day forecast horizon. As noted above, the LOSS of the present invention does not necessarily attempt to directly forecast inventory or replenishment levels, but it is fally capable of providing algorithms in other systems that do perform those tasks. Further, the LOSS of the present invention **tracks** recent sales and compares them to what was expected by the statistical model. When an item is selling far too fast or too slowly, this too is a problem for the retailer, so the situation is reported by the LOSS. These short-term forecasts preferably are automatically sent to a central location each day so they can be aggregated across stores and used for marketing and supply analyses.

1 0 It should be noted that the LOSS of the present invention is quite able to directly forecast in inventory or replenishment levels, if desired, and in fact is more accurate than previous forecasting systems. This is accomplished by removing the effects of stock-outs before generating such forecasting reports.

1 5 TRAINING THE LOYALTY OUT STOCK SYSTEM
Training the LOSS of the present invention: the system is pre-trained on historical data and/or trained once it is in operation on current data as it unfolds. The training is automatic. lt is trained automatically on historical data for one or more stores over a sufficienfly long period of time to enable the software to learn sales velocities for each item, and how this item's velocity varies with total store velocity, time of day, day of week, season, holidays, and general market conditions in the area where the store is located. This is an iterative process preferably consisting of (six) 6 stages, or "passes," followed by daily re-training at the end of each new day of activity.

Initial Training: the Loyalty Out-of-Stock System is nonnally trained on 1-2 years of historical data before being used for near real-time detection, although this amount of training can vary for predetermined conditions. As noted above, training occurs in iterative fipasses, " as

described immediately below.

Training Pass 1 - In the first pass, the LOSS comes up m4th a crude estimate of nonnal velocity (referred to as the "Initial Base Lambda") for each item having at least N observations, and uses this data to estimate nonnal velocity of similar but slower moving items. In this analysis, N is selectable by the system designer and can have a default
29
value of about twerity (20). In altemative preferred implementations of the present invention, the "top` N itenis are used, where `top" means those items with the most quantity sold or the most sales value over the most recent K weeks. K would typically be a number flke 13, 26, or 52, representing the past quarter, half, or full year.

Training Pass 2- - The above initial velocities are used in the stock-out detection module to estimate when the items were out of stock. The resulting OOS time periods are then subtracted from the training data, and the model is retrained to y(inverted exclamation mark)eld a better velocity estirnate (referred to as the "Intennediate Base LaMbda").

Training Pass 3 - The OO S adjustment process is again applied to the training data to produce the first estimate (referred to as the "Initial Alpha") of the effects of promotions, pricing changes and other vary(inverted exclamation mark)ng effects. The routine looks at the same itein (or class of similar items) across multiple stores and multiple time intervals with the same price, promotion and other conditions.

Training Pass 4 - The Intermediate Base Lambdas, together with the Initial 1 5 Alphas, are used as parameters to the stock-out detection module in training pass 4 to again estimate when itenis were OOS. These periods are again subtracted from the training data, and the model is trained for the fourth time to y(inverted exclamation mark)eld normal itein velocifies for each store (referred to as the Tinal Base Lambdas").

Training Pass 5 - These Final Base Lanibdas and the Initial Alplias are then applied to the historical data to once more detect OOS events. As in training passes 2-4, these OOS events are subtracted from the training data, and the effects of price, promotion, etc. are re-computed (referred to as the Tinal Adjustment Alphas"). In the same pass through the data, the Beta mean and variances are computed and stores in the Beta Table.

Historical OOS Event Database - At the conclusion of the above five-pass training operation, the Loyalty Out-of-Stock Systein makes a final run (Le., and sixth "pass`) through the historical data to detect all OOS events and save them in the Historical OOS Events Database. This database preferably is automatically transinitted to a central location for flirther analysis.

3 0
3 0
(DAILY)RE-TRAINING
As noted above, when the Loyalty Out-of-Stock System is used for a historical view of stock-outs, all of the data is in the initial training set (Le., there are no new days).
However, when the statistical model is used in a "real time mode,` the model detects OOS events throughout the day as new data arrives, then preferably retrains itself at the end of the day. This retraining will. update the contents of the Lambda, Alpha, and Beta Tables. It does not modify the OOS event database.

The procedural steps to accomplishthe daily retraining are as follows.

Append, New Data to Historical Data - As new data is processed, it is immediately 1 0 appended to the historical database. At the end of each. new day, this new data is ready for use in re-training. The new canonical transaction data can be automatically transmitted to a central location for storage and nirther analysis.

Re-Training Pass 1 - This pass is identical to the Training Pass 4, discussed above.

Re-Training Pass 2 - This pass is identical to the Training Pass 5, discussed above.

1 5 It will be understood that re-training could take place at time intervals other than dafly without departing ftom the principles of the present inyentian.

OUT-OF-STOCKPATTERNS
One of the major aspects of the present invention is to find pattems in OOS events.

Making useful determinations about this type of information is quite difficult, and in conventional systems of the past, useful information has not been forthcoming. Some of the important types of pattems that are analyzed by the present LOSS are as follows.

Pattems can be for various levels of aggregation of items.

Individual items;
Groups of items, such as a sub category like powdered laundry detergents;
Items of the same brand;
User-defined groups of items;
All items combined.

Pattems are also defined for various aggregations of stores, such as for.

Single stores;
3 1
Groups of stores, such as stores with the same distribution center or the same ownership.

Pattems are computed over various time intervals.

Year;
Quarter;
Over multiple time periods, such as all holidays;
A pattem is a statistical descrippion of OOS events under a set of qual(inverted exclamation mark)fy(inverted exclamation mark)ng attributes and their values. Attributes and their corresponding values are referred to as an `attribute set." The statistical description in the LOSS is either an estimated mean value of 1 0 a probability distribution or an approximation of the full distribution of values and their probabilities. The qualifying attributes of the events are.

Start time;
Duration;
Brand;
1 5 Time of day;
Price;

Promotion;
Store;
Day of week;
Season;
Holiday;
Item;
Flavor (if known);
Package size (if known);
Sub-category;
Category;
Distribution center (if known);
Store type (if known);
Store planogram type (if known);
3 0 Size of shelf facing (if known).

32
DISCOVERY OF CAUSES FOR OOS'S
Once a plurality of OOS events haye been detected, as shown in a step 750 of Figure 11, the LOSS of the present invention can automatically deterinine the cause of at least one OOS event based upon the attributes described above that are associated with the OOS event by using a combination of `standard attribute sets, " and "discovered attribute sets` found by an automated induction software algorithm.

Standard Attribute Sets.

With regard to standard attribute sets, certain OOS's are auributable to several common 1 0 causes, which the system uncovers by applying standard auribute sets to the OOS. For example.

Distribution center problems - This auribute set identifies cases where 00 S events for an item or time group are correlated across stores within a distribution center, but not correlated with stores in other distribution centers or with promotions, pricing actions, 1 5 season, or holidays. For OOS's with this pattem, the probable cause lies with a specific distribution center. See decision step 752 and step 754 on Figure 1 1.

Promotion or pricing problems - This attribute set identifies cases where the OOS are most likely due to under-estirnating the sales lift from a promotion or price decrease.

The attribute set selects OOS events where there is no clear distribution center problem, but the OOS items are being promoted or,price-reduced when they stock out. This usually indicates that category inanagement staff have under-estimated the customer response to price or promotion actions (or that they intentionally under stock promoted items). It may also indicate clearance items. See decision step 756 and step 758, as well as decision step 760 and step 762, on Figure 1 1.

Stock not available for promotion - This auribute set identifies cases where the onset of a stock out oceurs very soon after a price reduction or promotion. It indicates that the additional stock that is nonnally available for promotions has not arrived or was not placed on the shelves or display. See decision step 764 and step 766 on Figure 1 1.

Store problems - This attribute set identifies specific stores whose OOS levels are much worse than average stores. This is indicative of store management problems. See decision step 768 and step 770 on Figure 1 1.

33
Day of week problems - This attribute set identifies days of the week when OOS levels are much worse than average. This is done in two ways: based on the day the OOS begins, and based on days during which an OOS is in progress. This is indicative of days in which traffic is high and/or there is insufficient staff available for restocking. See decision step 772 and step 774 on Figure 1 1.

Time of day problems - This attribute set identifies "busy" times of the day during which an unusually high number of OOS's begin. This is indicative of titnes during which store traffic is high, but inadequate restocking activity is occurring (probably because staff are busy with registers). See decision step 776 and step 778 on Figure 1 1.

1 0 Seasonal problems - This attribute set identifies times of the year when stock-outs are excessive. (This analysis typically requires two or more years of data.) Certain items such as charcoal, cranberry sauce, insecticide, etc. have highly seasonal sales pattems.

Excessive stock-outs during periods of high sales would mean that category managers do not have adequate -understanding of this seasonality, or are unable to get sufficient stock.

1 5 See decision step 780 and step 782 on Figure 1 1.

DiscoveredAttribute Sets.

Along with attempting to match attributes associated with the OOS events with one or more of the standard attribute sets, the LOSS of this embodiment attempts to match attributes associated with the OOS events with discovered attribute sets identified by an automated induction algorithm, typically implemented in software. As will be apparent, the discovered auribute sets are preferably different than the standard attribute sets associated with distribution center problems, promotional problems, time of day problems and the Rke. In particular, the LOSS of one embodiment contains a statistical induction algorithm entitled WISDOM & SENSE (a trademark owned by, and commercially available through, TXN, Inc. of Los Alamos, New Mexico). The statistical induction algorithm constructs and analyzes a number of different combinations of attributes associated with the OOS events, each combination beina termed an attribute set.

From these differently constructed attribute sets, the LOSS preferably
34
automatically discovers attribute: sets, that are associated with excessive numbers of stock-outs, excessive durations of stock-outs, and excessive losses from stock-outs.

WISDOM & SENSE is a specific implementation of a general class of induction data . . algorithms that find conditions (attributes) under which the probability distribution or mean value of a variable differs significantly. Other `induction` algoriffims, such as C 5, could be used in place of WISDOM & SENSE. In the preferred LOSS, the conditions, uncovered by WISDOM & SENSE become a `discovered attributes set` whenever the probability for the number, or length, or cost of OOS events associated with those conditions, has a resulting distribution and median value that is much different than 0 what is normal. (`Normal` is defined by the unconditional distribution-that, is, when there are no special conditions). See steps 784, 786, and 788 on Figure 1 1.

In the WISDOM & SENSE algorithm, `much different` is determined by the K-S test results 'that the WISDOM & SENSE algorithm per rms ea time (inverted exclamation mark)t tests a candidate set of attributes. By default, a K-S probability of 0.01 or less, together with a difference in sample means of at least 5 percent (5%), implies that the distributions are "much differenC.

Low service levels - When the distribution associated with the discovered attribute sets results in a larger mean value, the discovered attributes have identified conditions under which low service levels oecur. These are cases where there is not enough stock. See decision step 790 and step 792 on Figure 1 1.
Excessively high service levels - When the distribution associated with the discovered attribute sets has a very low mean value, the discovered attributes have identified conditions under which service levels are too high (the item is nearly always available). This means either the item does not sell or there is too much stock in the store. Either the item should be eliminated, the shelf space should be reduced, or the frequency of restocking should be reduced. See decision step 794 and step 796 on Figure 1 1. In instances in which the LOSS does not match the attributes associated with an OOS event with a standard attribute set or a discovered attribute set, the LOSS preferably collects more data and repeats the analysis process. See step 798 on Figure
35
OOS IMPACTS ANALYS1S
As depicted in Figure 12, the LOSS of the present invention will determine what customers do when confronted with an OOS event, if the POS data contains a customer number. This analysis works by **tracking** what is out-of-stock when each identified customer shops. When the customer checks out, all items that the customer has previously purchased are examined. The system uses historical data to estimate the expected amount of each item to be purchased given the size of the transaction (check out). See steps 800, 802, 804, and 806 on Figure 12. Some of the possible reactions by 0 a customer, or other related factors are as follows.
Substitution - For each of these items that is currently out-of-stock, the LOSS calculates whether the amount of substitute items is above the expected purchases of these substitutes by the customer. An' increase in urchases of substitutes over the expected
y p
value is counted as a switch to the substitute. lf the amount of switching is less than or 5 equal to the expected a,mount to be purchased of the OOS item, then the system assumes that the customer satisfied his demand for the OOS item completely by switching.

Substitutes are found in two alternate ways: the first way treats all items in the sarne category as substitutes. The second way is more restrictive. All items in the same subcategory are substitutes. Switching to substitates of the same brand is tabulated separately from switching to other brands. See decision step 808 and step 8 1 0 on Figure 12.

Delayed Purchase - lf switching does not account for the total expected purchase of the OOS item, the LOSS determines whether an item purchase was satisfied on the customer's next trip. This contribution is measured by subtracting the expected purchase for the next trip from the actual purchase for the item. lf this is greater than zero, this excess purchase is considered to be a delayed purchase from the previous trip in which the customer experienced an OOS event. See decision step 812 and step 814 on Figure 12.

Lost Sales - Finally, if the amount of switching plus delayed purchase is

still less than the expected purchase amount when the customer experiences the OOS, the remainder is counted as a lost sale for the retailer. See step 816 on Figure 12.

Item Loyalty - When summed over all consumers of the item who experienced an OOS of the item, the LOSS provides an excellent estimate of what the average customer
36
does when an (inverted exclamation mark)tem is out of stock; for example: amount switched to same brand, amount switched to other brand, amount due to a delayed purchase, and amount from a lost sale.

The system combines this information into a single measure of customer loyalty to the item.

This measure is computed as ("ftaction of sales losC + j x 'Traction of sales switched to same brand` + k x 'Traction of delayed purchase`). The parameters j and k have default values of three (3), and their values can be changed when the system is installed. Larger values of this measure are associated with higher loyalty to the item.

Brand Loyalty - The average loyalty of all items of a particular brand measures brand loyalty.

1 0 Retail Chain Loyalty - Store loyalty is measured by taking the average across all items of (1 - 'Traction of sales losC).

ALTERNATIVE OOS IMPACTS ANALYSIS
An alternative, more detailed, methodology can be used for analysis of OOS 1 5 impacts on customers and for measuring loyalty to items, brands, and store chains.

This alternative methodology makes use of the detected OOS events as a `test` of consumer loyalty. Such testing could be conducted by intentionally denying access to various items and then measuring consumer response, but (inverted exclamation mark)t is far preferable to make use of the frequent, unintentional stock out events to aecomplish this measurement. As depicted in Figure 13 (for this alternative methodology), the LOSS of the present invention will determine what customers do when confronted with an OOS event, if the POS data contains a customer number. This analysis works by **tracking** what is out-of-stock when each identified customer shops. When the customer checks out, all items that the customer has previously purchased are examined. The systein uses historical data to estimate the expected amount of each item to be purchased given the size of the transaction (check out). See steps 900, 902, and 906 on Figure 13. It also estimates the `demand` as a variable quantity defined as the expected purchase amount of items that currently are outof-stock, in a step 904. Some of the possible reactions by a customer, or other related factors are as follows.

37
Substitution - For each'of these items that is currently out-of-stock, the LOSS calculates whether the amount of substitute items is above the expected purchases of these substitutes by the customer. Referring now to the flow chart of Figure 13, a step 908 computes a "surplus" of substitute items (a variable) by subtracting the expected purchase amount of substitutes from the actual purchase amount of substitutes. If the surplus variable (or surplus " amounC) is greater than zero (0), as determined by a decision step 9 1 0, then a step 912 sets the surplus variable to the lesser value of the "demand" or the previous

"surplus"value.
Otherwise,decisionstep910directsthelogieflowtoanotherdecisionstep 918. After step 912 sets the surplus variable, a step 914 concludes that the customer has substituted the surplus amount for the item that was OOS. A step 916 now reduces the demand variable by the surplus amount.

The decision step 918 determines whether the demand variable is greater than zero (0), and if not, finishes this routine. If the demand variable is greater than zero, then a step 1 5 920 computes the surplus variable's value for the "next trip` by subtracting the amount of the item expected to be purchased from the amount actually purchased on the next trip. A decision step 922 then determines whether or not the surplus variable (or surplus "amounC) is greaterthan zero (0).

Delayed Purchase - If switching does not account for the total expected purchase of the OOS item, the LOSS determines whether an itera purchase was satisfied on the customer's next trip. lf the result at decision step 920 was YES, then a step 924 sets the surplus variable to the lesser value of the "demand" or the current surplus value. A step 926 then concludes that the customer has delayed buying the surplus amount for this item until the next trip to the store. A step 928 now reduces the demand variable by the surplus amount.

Lost Sales - Finally, if the amount of switching plus delayed purchase is still less than. the expected purchase amount when the customer experiences the OO S, the remainder is counted as a lost sale for the retailer. If the result at decision step was NO, then a step 930 concludes that the remaining demand represent lost sales for the item at the store/retailer. This routine ends after that step.

3 8
It should be noted that the logic flow from step 928 can either go to the "END" of this routine, or more preferably, (inverted exclamation mark)t is directed to the step 93 0 where the remaining demand is designated as `lost sale? for the store. In this second instance, the lost sales may either be pennanent or temporary. lf the logic flow reaches step 930 from step 926, then the lost sales amount is only temporary.

Item Loyalty - When summed over all consumers of the item who experienced an OOS of the itern, the LOSS provides an excellent estimate of what the average customer does when an item is out of stock; for example: amount switched to sarne brand, amount switched to other brand, amount due to a delayed purchase, and amount from a lost sale.

The system combines this infonnation into a single measure of customer loyalty to the item.
This measure is computed as ('Traction of sales losC + j x 'Traction of sales svatched to same brand" + k x " fraction of delayed purchase `). The parameters j and k have default values of ten (10), and their values can be changed when the system. is installed. Larger values of this measure are associated with higher loyalty to the item.

1 5 Brand Loyalty - The average loyalty of all items of a particular brand measures brand loyalty.

Retail Chain Loyalty - Store loyalty is measured by taking the average across all items of (1 - `fraction of sales losC).

lt will be understood that there are other methods of calculating loyalty besides those presented above. The above specific implementation should

not be construed as being the only method of calculating this loyalty from detected stock outs3 and the way in which consurners react by substituting another item of the same brand, switching to another brand, purchasing on a later oecasion, or not purchasing at all. It is contemplated that the present invention can combine these factors in other ways to produce a loyalty measurement.

INPUTDATA
With regard to data that is input to the LOSS, the OOS detection analysis system works on coramonly available POS data streams or other similar data sources. It also makes use of infonnation about each item, herein commonly called the "ltem table.` (In
39
some circumstances, (inverted exclamation mark)t could be referred to as a 'UPC Table, or SKU Table.") Finally, (inverted exclamation mark)t optionally makes use of store information. The POS data - This data stream or a similar data stream includes the following information.

Time and date of transaction;
Store number;
Customer number (optional);
Item number;
Quantity purchased;
1 0 Amount paid (extended or unit);
Amount of discount;
Promotion, display, ad, price reduction, coupon (these are not necessarily in the same data stream as the POS data).

1 5 Alternatively, the POS data can consist of hourly or daily summary data.
Hour and day of surmnary;
Store number;
Item number;
Quantity sold;
Average price;
Average discount;
Promotion, display, add, price reduction, coupon;
Average units sold per transaction (this might (inverted question mark)ome from a sample of transaction data that includes the items to be monitored, or from a table derived from data for other retailers. lf unavailable, it is a manually input parameter R. with a suggested value of 1.5).

The Item table - This table contains the following information for each item.

Item number (may be same as UPC);
UPC number;
Description;
40
Shelf space allocation (optional);
Package size (optional);
Flavor (optional);
Brand;
Manufacturer;
Major category (optional);
Category;
Sub-category;
Regular Price;
0 Current Price;

Current Promo Type; (optional)
The Store table - All information in this table is optional. The store table contains the following information for each store.

5 Store number;
Store description;
Store location;
Store distribution center;
Store marketing area;
Store type;
Store planogram type.

In conjunction with the descriptive infonnation provided hereinabove, several flow charts are also provided with more detailed explanations about many of the important logical or mathematical operations that are performed by the present invention. A step 200 on Figure 3 signifies the beginning point of a 'Load. UPC Table into Memory` routine. At a step 202, the first operation is to create an empty UPC hash table. (Note: a `hash table" as used herein refers to a table in memory that can be quickly indexed by a specific key, which can be an arbitrary string of bits.) A step 204 now opens an Item input file (which preferably consists of ASCI1 text). Now a step 206 reads each input record, validates the
41
data (while discarding bad data), and stores the data in hash table, keyed by Item Number.

A step 208 then eloses the Item input file.

A step 220 signifies the beginning point of a routine that loads the "Store Table` into memory. A step 222 creates an empty store hash tabla 'after which a step 224 opefis a store input file (preferably ASCH text). For cach input record, a step 226 reads the record, validates the data (while discarding bad data), and stores the data in the hash table, keyed by Store Number.

A step 240 signifies the beginning point of a routine that creates an Historical Canonical TransactionDatabase. This database is "canonical" because it will re-format data 0 streams into a standard format, if necessary, that is most usable by this database. In other 5 invention.

This first function of this routine opens a historical data file at a step 242, in which this historical data file will normally consist of various binary, ebcdic, packed-decimal, and ASCII formats. For each input record, a step 244 reads the record, possibly by combining portions of the record from. multiple input sources, then validates the data (while discarding bad data), and converts the data to a canonical format. A step 246 now stores the canonical record in a canonical transaction database.

Now a step 248 updates the canonical database hash tables. A step 250 sorts the database by store and time. A step 252 copies the database to create a second copy that can be sorted by a different set of criteria, and a step 254 sorts this database copy by customer and time. Finally, a step 256 saves all database hash tables and database copies as the "Historical Transaction Database." An optional step 258 may be used to transmit the canonical database to a central location for storage and flirther analysis.

TRAINING THE OUT-OF-STOCK (OOS) DETECTOR.
Now referring to a logic block 300 on Figure 4, as discussed hereinabove the training of the OOS detector occurs in multiple passes. A step 3 1 0

signifies the beginning
42
point of the first pass of training, which computes the Initial Base Lambdas. Much of the logical and mathematical operations are iterative, and typically the same functions will be perfonned on each item record or combination item/store record, one at a time. At a step 3 12, for each store in the historical transaction database, every item sale record is processed.

Then data is accumulated, by: computing the total store sales `T-1 " since initial time stamp
at a step 314, computing the total category sales "T
2," for cach category, since initial time
stamp at a step 316, and saving the store and category cumulative sales in memory as an array indexed by timestamp in minutes since initial time at a step 3 1 8.

A step 320 now re-processes every item sale record, and computes individual item lambdas. "Lambda-1 " (U) is calculated as follows: for the current item, at each observed price, and for different combinations of promotion and season, etc., calculate M for the observation of a specific item, store, price, promotion, etc. as the inter-arrival time (time between observing the item in a transaction) divided by store sales (T-1) in the corresponding time interval. Find and save the sum of A(inverted exclamation mark), median of M, and sum of M squared. If there are too few observations for good estimates under specific conditions, then before computing the sum, median, and surn'of M squared, combine observations for similar prices and other conditions to increase the sample size. This may be accomplished by use of a 2-sample KoImogorov-Smirnov (K-S) test to see if the observed Ms for two similar sets of conditions are probably different based on the K-S test statistic.

Store sales T-1 in the interval are obtained from the array created in step 318.

"Lambda-2" (U) is calculated in the same way, except divide by elapsed category sales T The sums, median, and sums of squares of lambda-1 and lambda 2 are maintained.

For each itern, a step 322 uses the sums, the medians, and sums of squares of lambda---1 and lambda 2 to calculate their means and standard deviations, and from these, the standard errors. The rneans E are first calculated from the medians M, using the formula E = M / (natural log 2). Now a step 324 chooses the lambda with the smaller standard error for each item. in the store, and saves this information in the Base Lambda Table as the Initial Lambda for the store-item. All of the steps 312 through 324 are executed for each item of a single store, and then this processing continues with the next store until all stores are processed that reside in the historical transaction database.

43
A step 330 signifies the begiming point of the second pass of training, which computes the Intermediate Base Lambdas. Again, much of the logical and mathematical.

operations are iterative, and typically the same functions will be performed on each item record or combination item/store record, one at a time.

At a step 332, all adjustment Alphas are set to a default value of 1 lt will be understood that different default or starting values could be used for the adjustment Alphas without departing from the principles of the present invention. Then for each store, and for each item purchased, a step 334 applies an "OOS event detection routine" (which is discussed in greater detail in reference to a step 500 on Figure 9) to the item's inter-arrival 0 time, using the Inifial. Base Lambda times the default Alpha. A computed probability variable will now be used, referred to herein as T(t>T)," which represents the computed probability of the Poisson inter-arrival time t being longer than the observed inter-arrival time T.

A step 336 now determines the following: if P(t>T) is less than "X", then save this information as an OOS event for the store-item using a logic routine described in greater detail in reference to a step 550 on Figure 10. The default value of X preferably is set to 0.005, however, this value can be changed when the system is installed or maintained. The default value of 0.005 results in a low false alann rate, but more OOS events are "missed" (Le., they are not determined or"'announced" as being an OOS event). It will be understood that a different default value for X could be used without departing from the principles of the present invention. The Rmctions performed by steps 334 and 336 are repeated until there is no more historical data for the store. The historical transaction database pointer is now reset to the first item record for this store.
A step 338 now processes every (inverted exclamation mark)tem sale record aceording to steps 312 through 3 18, with the following modifications: if any OOS event time intervals saved in step 33 6 for the item. overlaps the current inter-arrival time interval, then (1) subtract the store sales during the OOS event from stores sales in step 320, and (2) subtract the category sales during the OOS event from category sales in step 320, to compute T-1 and T-2 with modified values. In addition, a step 340 re-processes every item. sale record according to 0 steps 3 12 through 3 1 8, with the same modifications as above, to compute lambda-1 and lambda-2 with modified values.

44
For each item, a step 342 uses the sums, medians, and sums of squares of lambda-1 and lambda 2 to calculate their means and. standard deviations, and. from these, the standard errors. A step 344 now chooses the lambda with the smaller standard error for each item in thestore. ThisvalueissavedintheBaseLainbdaTableasthelnterrnediateBaseLambda for the store-item. Finally, this second training pass is completed by emptying the OOS event table, and repeating steps 334 through 344 until there are no more stores.

A step 350 (now referringto Figure 5) signifies the beginningpoint of the third pass of training, which computes the Initial Adjustment Alphas. Once again, much of the logical and mathematical operations are iterative, and typically the same functions "l be 0 perfonned on each item record or combination item/store record, one at a time, although in some cases, calculations will. involve all stores for a particular item.

Starting with a step 352, for each item across all stores, and for each sale record for the item, deviations "D" of the actual inter-arrival times from the Base Lambda. are calculated for every item, every time a sale is observed. These observationg occur under various conditions of price, promotion, season, time-of-day, day-of-week, holiday, market conditions, etc. The term "effect" refers to these different conditions. At a step 354, these deviations for cach effect are saved in a set De

indexed by the effect values (price, promotion, season, tiine-of-day, day-of-week, holiday, market conditions). This indexing is aceomplished by using the effect values to create a key into a hash table that stores the D values for each set D.. All effect values (e.g., the 6-digit Boolean promotion string) are treated as if they were ordered values, as opposed to categorical values. Steps 352 and 354 are repeateduntil there are no more records for the itern.

A step 356, for each effect "E" with deviation set D., clusters the item-effect deviations. The mean and variance of these deviations within a cluster will be used as an item effect adjustment to Lambda. The adjusunents are computed over grouped, or clustered, effect values to improve the stability of the adjustments, by applying a 2-sample K-S test to the sets of deviations for each pair of adj acent effect values that have non-emptY D. sets. Unless the K-8 probability is less than a variable threshold "Z " (the default value is Z=0.01),whichisdeterminedatadecisionstep358,combinethetwosetsatastep360. It will be understood that different default values for Z could. be used without departing from the principles of the present invention. A decision step 362 determines whether or not there
45
is only a single remaining step. If not, then steps 356 through 360 are repeated until there is just one set, or no remaining pair of sets for adjacent effect values having a K-S probability less than Z. The functions of stepi 356 are repeated for each effect E. The results are groups of effect sets with similar behavior; that is, within the group of effeets, the deviations D from the Base Lambda are similar, and the same adjustment will be made to Lambda.

A step 364 now calculates the mean D for each remaining set. After that occurs, a step 3 66, for each pair of sets, and in decreasing magnitade of mean D, applies the 2-sample K-S test, using the individual D values (not the means) for each set.' Unless the K-S probability is less than Z (again, the default value of Z=0.01), which is determined at a decision step 368, combine the sets at a step 370. A decision step 372 now determines whether or not any further sets can be combined, and if so steps 366 through 370 are repeated until no more sets can be combined aecording to the K-S test against threshold Z.

A step 374 saves an Alpha adjustment value of (1 + (mean D -- Base Lambda>> and the variance of this D for each clustered group of effects in the Adjustment Alpha Table, indexed by the corresponding effects comprising that effect group as determined in the clustering procedure above. The Adjustment Alpha is used as described above as a multiplier on Base Lambida. Steps 352 through 374 are repeated for each item.

The values in the Adjustment Alpha Table represent average adjustments to a Poisson model for inter-arrival times with parameter Base Lambda. The aceuraey of the model is improved by using Base Lambda times Adjustment Alpha from the Adjustment Alpha Table in place of previous Base Lambda values. The variance in the Adjustment Alpha Table is used to ascertain the goodness-of-f1t of the model. 1f the variance is large, then the f1t is not good, and various thresholds are automatically loosened.
A step 390 (now referring to Figure 6) signifies the beginning point of the fourth pass of training, which computes the Final Base Lambdas. Since this training pass will utilize many steps previously described above, much of the logical and mathematical operations are iterative, and typically the same functions will be performed on each item.

record or combination item/store record, one at a time.

3 0 At a step 3 92, all adjustment Alphas are set to their Initial Adj ustment Alphas from the hash table (and not the default Alpha values used previously). Then for each store, and
46
for eachitempurchased, a step 394 appliesthe "OOS event detectionroutine` (discussed in greater detail in reference to Figure 9) to the item's inter-arrival time, using the Initial Base Lambda times the default Alpha. A computed probability variable will now be used, referred to herein as T(t>T)," which represents the computed probability of the Poisson inter-arrival time t being shorter than the observed inter-arrival time T.

A step 396 now determines the following: if P(t>T) is less than "X", then save this infonnation as an OOS event for the store-item using a logic routine described in greater detail in reference to Figure 1 0. The default value of X preferably is set to 0.005, however, this value can be changed when the system is installed or maintained. The default value of 1 0 0.005 results in a low false alarin rate, but more OOS events are "missed` (Le., they are not determined or "announced" as being an OOS event). The nmctions performed by steps 394 and 396 are repeated until there is no more historical data for the store. The historical transaction database pointer is now reset to the first item record for this store.

A step 398 now processes every item sale record according to steps 312 through 318, with the following modifications: if any OOS event time intervals saved in step 336 for the item overlaps the current inter-arrival time interval, then (1) subtract the store sales during the OOS event from stores sales in step 320, and (2) subtract the category sales during the OOS event from category sales in step 320, to compute T-1 and T-2 with modified values. In addition, a step 400 re-processes every item sale record aceording to steps 312 through 3 1 8, with the same modifications as above, to compute lambda-1 and lambda-2 with modified values.

For each item, a stepi 40.2 uses the sums, medians, and sums of squares of lambda-1 and lambda-2 to calculate their means and standard deviations, and from these, the standard errors. A step 404 now chooses the lambda with the smaller standard error for each item in the store. This value is saved in the Base Lambda Table as the Intermediate Base Lambda for the store-item. Finally, this fourth training pass is completed by emptying the OOS event table, and repeating steps 3 94 through 404 until there are no more stores.

A step 41 0 (now referring to Figure 7) signifies the beginning point of the fifth pass of training, wluch computes the Final AdjusunentAlphas and a "Beta Table.' As before in the third pass of training, much of the logical and mathematical operations are iterative, and typically the same functions will. be performed on each item record or combination
47
item/store record, one at a time, although in some cases, calculationsi will involve all stores for a particular item.

The deviations computed in steps 352-374 (see Figure 5) are now re-computed based upon deviations from the Final Base Lambdas. Beginning with a step 412, for each item across all stores, and for each sale record for the item, deviations D of the actual interarrival times are calculated for every item, using Final Base Lambdas from the Lambda Table created in step 404. At a step 414, these deviations for each effect are

saved in a set D. indexed by the effect values (price, promotion, season, time-of-day, day-of-week, holiday, market conditions) re-using the hash table to store the D values for each set D.. All 1 0 effect values (e.g., the 6-digit Boolean promotion string) are treated as if they were ordered values, as opposed to categorical values. Steps 412 and 414 are repeated until there are no more records for the item.

A step 416, for each effect "E" with deviation set D,,, clusters the item-effect deviations. The mean and variance of these deviations within a cluster will be used as an 1 5 item effect adjustment to Lambda. The adjustments are computed over grouped, or clustered, effect values to improve the stability of the adjustments, by applying a 2-sample K-S test to the sets of deviations for each pair of adj acent effect values that have non-empty D, sets. Unless the K-S probability is less than a variable threshold "Z" (the default value is Z=0.01),whichisdetenninedatadecisionstep418,combinethetwosetsatastep420. It will be understood that different default values for Z couId be used without departing from the principles of the present invention. A decision step 422 determines whether or not there is only a single remaining step. If not, then steps 416 through 420 are repeated until there is just one set, or no remaining pair of sets for adjacent effect values having a K-S probability less than Z. The functions of step 416 are repeated for each effect E. The results are groups of effect sets with similar behavior; that is, within the group of effects, the deviations D from the Base Lambda are similar, and the same adjustment will be made to Lambda.

A step 424 now calculates the mean D for each remaining set. After that occurs, a step 426, for each pair of sets, and. in decreasing magnitude of mean D, applies the 2-sample 3 0 K-S test, using the individual D values (not the means) for each set. Unless the K-S probability is less than Z (again, the default value of Z=0.01), which is determined at a
48
decision step 428, combine the sets at a step 430. A decision step 432 now determines whether or not any ftulher sets can be combined, and if so steps 416 through 420 are repeateduritil no more sets can be combined according to the K-S test against threshold Z.

A step 434 saves an Alpha adjustraent value of (1 + (mean D -- Final Base Lambda>> and the variance of this D for each clustered group of effects in the Adjustment Alpha Table, indexed by the corresponding effects comprising that effect group as determined in the clustering procedure above. The Adjustment Alpha is used as described above as a multiplier on Final Base Lambda. Steps 412 through 434 are repeated for each item.

1 0 At step 436 now computes Betas in the same manner as the Alphas, using steps 412 through 434, except that D now represents the quantity of item purchased in a transaction.

The Beta values thereby computed are placed into a Beta Table.

A step 450 signifies the starting point of a procedure that creates a `Historical OOS Event Database," now in reference to Figure 8. For every store in the historical transaction 1 5 database, and for every itera purchase for the store, and in time order, a step 452 calls for the execution of the Event Detection Routine (found at step 500 on Figure 9) and of the Compute OOS Event Attributes routine (found at step 550 on Figure 10). The Event Detection Routine 500 and Compute OOS Event Attributes routine 550 are continued until there are no more item purchases records for the store. This functional step 452 is continued

until there are no more stores to be processed. Preferably, a step 454 now transmits the OOS Event Database to a central location for farther analysis.

A step 470 signifies the starting point in saving the Trained Detector in a computer memory. A step 472 saves the Final Base Lambda Table to disk for future use, and saves the Final Adjustment Alpha Table to disk for fature use. A step 474 saves the Store Table to disk for fature use, and saves the UPC table to disk for fature use. A step 476 saves the Historical OOS Events Database to disk for future use, and saves the cumulative store and store-category sales arrays to disk for future use. lt will be understood that any type of computer bulk memory storage device couId be used for storing these various tables and databases, vathout departing from the principles of the present invention. Obviously, a magnetic hard disk drive is a logical choice in view of its relatively quick access times and its large storage capacity. Certainly optical read/write memory devices couId also be

suitable, especially for very large data sizes, and in view of the faster access time that will undoubtedly by available in the future- An optional step 478 will preferably now transmit the saved, trained detector to a central location for use in recovery if the monitor system is later lost.

DETECT OOS EVENT.

A step 500 on Figure 9 signifies the beginning of a routine that detects an OOS event. The first operation at a step 502 is to determine the elapsed time 'T' since the last store-saleofaparticularitem. Astep504thendetenninesthestoreorcategorysales"S"in the interval, depending on whether the Base Lambda for the item. used the store or category sales. A step 506 then retrieves the Base Lambda and Adjustment Alpha from the correspondingtables.

A step 508 now computes the probability that the Poisson inter-arrival time fltff is greater than the observed inter-arrival time "V' In other words, step 508 finds P(t>T). A decision step 5 1 0 then determines if P(t>T) is less than X, typically about 0 lf the answer is YES, then an OOS event is in progress at a step 512.

A new variable referred to as "tk" represents the elapsed time for the (most recent) past "k" arrivals of the same item. lf the answer at decision step 5 1 0 was NO, then a step 520 computes the Poisson probability of observing fewer than "K" arrivals during the time interval tk. If a decision step 522 determines that this probability is significantly large (approaching 1.0, for example), then a step 524 concludes that a "fast" event in is progress.

On the other hand, if decision step 522 determines that the probability.was not `large," then the logic flow is directed to a step 530. A new variable referred to as "tj" representstheelapsedtimeforthe(mostrecent)past"j"arrivalsofthesameitem. Step530 now computes the Poisson probability of observing more than 'T' arrivals during the time interval tj. If a decision step 532 determines that this probability is significantly large (approaching 1.0, for example), then a step 534 concludes that a "slow" event in is progress.

lf the result at decision step 532 was NO, then the routine of Figure 9 retums.

The values for J and K can be set to the sarne number, as was the case in

the abovedescribed example. However, they can be independently evaluated and set to different numbers, if desired. As an exemplary value, if Lambda is well known, then J and K can
50
both be set to 5. However, if Lambda is not yet well known, then J and K should be set to larger values than 5. In decision steps 522 and 532, the mathematical comparison can be such that a value of 0.99 or 0.999 is used to determine whether or not a probability is
Iarge.11
It will be understood that many numeric values could be used other than those presented above without departing from the principles of the present invention. These are exemplary values, which have produced good results in preliminary testing. Moreover, the value for J could be modified in real time if a (inverted exclamation mark)t requires a very long time before the past "j" arrivals of the same item actually occurs-in fact, J could be set to ` 1 " if necessary, in order 0 to provide at least: some preliminary results for a particular item that is moving very slowly.

Of course, the time interval tj would be affected by this change of value for J.

COMPUTING OOS EVENT ATTRIBUTES.

A step 550 on Figure 10 signifies the starting point of a routine that computes OOS event attributes and saves them in an Event Database. A step 552 begins by filling in the OOS event data structure as defined in hereinabove. A step 554 then appends the OOS event to the OOS Event Database. A step 556 now triggers any alarms and/or displays the event as defined by an application (POS Monitor) user interface.

Use of the median is an important aspect of the probability model, as it enables the system to get a good estimate of what the "true" item. movement velocity would be in the absence of any historical OOS events. The arrival rate (movement velocity) is modeled by a Poisson distribution. The relationship between the true mean (E) and the true median (M) of this model is E = M/(natural log 2) = M/(.693). The system relies on this "true relationship" to improve its estimates of the model probability velocity. The median is much less sensitive to distortions produced by historical OOS events.

Notwithstanding the improvernents obtained by using the median, the system later recomputes medians, means, and variances for the historical data after removing historical OOS events detected in the historical data on an initial training run. This initial pass, plus the use of medians, enables to system to remove most of the effects of historical OOS events from the model probability velocities. This enables it to detect
5 1
fast, slow, and OOS events, and, to make better short-tenn (e.g., 1 to 7 days out) item sales forecasts.

The use of the median to estimate the model parameter Lambda reduces bias in the estimate of the true Lambda parameter that otherwise arises from the contaminating effect of historical OOS events.
READ NEW POS DATA.

A step 600 on Figure 10 signifies the starting point of a routine that reads in new point-of-sale data. Beginning at a step 602, transaction data is acquired from the POS system. (e.g., the POS store controller 60 on Figure 1). A step 604 now converts the acquired transaction data to a

canonical format. A step 606 then u:pdates the store and/or category sales arrays. A step 608 updates event auributes, and the revised event is saved.

Now a step 6 1 0 tenninates any ongoing OOS event for this store-item.

1 5 DETECT NEW OOS EVENTS
A step 650 on Figure 1 0 signifies the starting point of a routine that detects new Out of Stock Events, and saves these event in the Events Database on a periodic basis (such as every 10 minutes). For each store and each item, a step 652 periodically calls for further action, such as every 1 0 minutes (although this time parameter could certainly be altered without departing from the principles of the present invention).

A step 654 then executes the `Detect OOS EvenV module (or routine) at stepi 500 on Figure 9. A decision step 656 now determines whether or not an OOS Event was detected. lf an OOS event was detected, then a step 658 executes the "Compute OOS Event Attributes ` module at step 5 50 on Figure 1 0.

lt is preferred that the updated OOS events are periodically transmitted to a central location for retention and flirther analysis, at a step 670. This should occur several times per day, perhaps on an hourly basis. This routine 650 then retums at a step 672.

52
SUMMARIZEEVENTDATA.

A step 700 on Figure 1 0 signifies the beginning of a tabulation of several parameters and system calculated datum points. At a step 702, the following information is tabulated.

Total Number of Events;
Average Duration;
Average Loss;
Service Level.

These above information is flinher tabulated by store, by category, by distribution center, by Day-of-Week and Hour-of-Day, by major brand (e.g., if a brand accounts for 1 0 more than 1 % of a store's sales).

In addition to the above features provided by the present invention, the preferred LOSS is also capable of discovering causes of OOS events and determining impacts of OOS events, as related hereinabove in detail. Moreover, the preferred LOSS is capable of retraining the OOS Detector every 24 hours (or other time interval), if desired. This, too, is 1 5 discussed hereinabove in detail in the above section referred to as "Daily Re-training. " Referring now to Figure 14, a block diagram of major components of a preferred Loyalty Out-of-Stock System (LOSS), generally designated by the reference numeral 950, is provided. This system 950 includes a data feed module, a transaction database, an item velocity model and anomaly detection module, a data server, an item movement event notification client, and a world-wide-web http server.

The data that is input to the LOSS 950 arrives at a communicationfink 952, and this data includes both item movement and price information. A POS data feed module 954 received this information via a communication port, which make up a Mata inpuV stage of the LOSS 950.

A "computation" stage of LOSS 950 is essentially the heart of the system.

Data is received from the POS data feed module 954 at a "transaction and price database" 960,
whichthenfeedsdata,asneeded,tovariousothersoftwaremodulesofLOSS950. Oneof these software modules is an `(inverted exclamation mark)tem velocity model and anomaly detector" 964, while a second of these software modules is a "consumer impact assessmenC module 966. The transaction and price database 960 also feeds data to a data server fianction or module 962, which provides information as needed to other modules or hardware components.

53
The various software modules (or functions) each receive data and generate data that must be stored in a memory circuit of some type. For example, the transaction and price database 960 and the data server 962 modules need to store data on one or more hard disk drives, or other type of memory storage device (such as an optical memory unit), which. are used for non-volatile mernory storage of the relatively large quantities of inforinationusedbytheLOSS950.
Whileportionsofthedatabase960willresideinRAM (not shown) during data accesses by the system 950, (inverted exclamation mark)t would not be typical for the entire database 960 to reside in RAM at one time (although it could if sufficient RAM were provided).
The item velocity model and anornaly detector module 964 also provides data to the data server module 962. The consumer impact assessment module 966 both provides data to and makes inquiries from the data server module 962. This consumer impact assessment module 966 is optional in the LOSS overall system 950. lf present, the consumer impact assessment module 966 would norinally reside on the same computer as the transaction and.

price database 960, item velocity model and anornaly detector 964, and. data server 962.

Another component of the computation stage is an Out-of-stock pattem discovery module 968 (the OOS pattem discovery module), which also in an optional component in the LOSS overall system 950. This OOS pattem discovery module 968, if present, will preferably reside on a centralized computer (not shown as a specific hardware component) where it has access to data served from multiple stores (or warehouses), so that it can `discove? multi-store pattems. However, the OOS pattem discovery module 968 is able to reside on the same computer as the transaction and price database 960, item velocity model and anomaly detector 964, and data server 962-in. that event, the OOS pattem discovery module 968 may be able to "discover" pattems offly for a single store (or warehouse), although the various modules of the computation stage can each handle data for multiple stores, so long as they are placed in communication with those multiple stores (or warehouses). The data server module 962 and OOS pattem discovery module 968 communicate with each. other in both directions.

The data server module 962 can pass data to a 'system outpuf stage of the LOSS 950. This system output stage includes an HTTP server 970, which. outputs data in an
54
HTML web-browser format at 972, and an "item. movement event notification clienf module 974, which outputs data as XML notifications at 976.

Both types of output messages (Le., the HTML web-browser data 972 and the XML notifications 976) contain various types of information, including: `OOS` events, "Slow/Fast Velocity" events, "Threshold" events, "Surnmary" events, "OOS pattems, and liconsumer impact? and "consurner loyalty to

items" information. These various types of infonnation are grouped at a block 980 on Figure 14.

Some of the above-described system components must reside on the same computer platfonn: for example, the transaction and price database 960, item velocity model and 1 0 anomaly detector module 964, and data server 962 must be so grouped. However, these three modules 960, 962, and 964 can be located at a store (for example, on the store's POS computer or other type of personal computer or PC), at a store chain's company headquarters, or at an application service provider's (ASP) location.

The POS data feed module 954 can reside on the retailer's store controller (or POS 1 5 computer) or another PC at the store, or it couId reside on the same computer platform at the above tliree modules 960, 962, and 964.

The HTTP server 970 also can reside on the sarne computer platfonn at the above three modules 960, 962, and 964. Alternatively, it couId reside on its own computer platform or machine at a central location, if desired.

The item rnovernent event notification client module 974 also can reside on the sarne computer platform at the above three modules 960, 962, and 964. Altematively, (inverted exclamation mark)t couId reside on its own computer platform or machine at a central location, if desired.

Morcover, (inverted exclamation mark)t could reside on the sarne computer platform as the HTTP server 970.
The computation modules 960, 962, 964, 966, and 968 can handle multiple stores, if desired. Of course, the POS data feed module 954 wouId, in that case, need to be in communication with each of these desired stores. Naturally, these computation modules 9601 9629 9641 966, and 968 can be used for only a single store, if that is the desired configuration.

It will be understood that the principles of the present invention directly apply to retail stores (such as grocery stores), warehouses, stockroorns, and distribution points (such as those owned or operated by a manufacturer of consumer goods to supply those goods to
55
various individual stores), as well as other applications where inventory items are disbursed.

according to a potentially varying, yet sornewhat predictable rate over time, or a rate with respect to another characteristic or parameter.

I-t will be further understood ---that the logical operations described in relation to the flow charts of Figures 2-1 0 can be implemented using sequential logic, such as by using microprocessor technology or using a logic state machine for some operations; (inverted exclamation mark)t even could. be implemented using parallel logic. The preferred embodiment uses a microprocessor (e.g., microprocessor or CPU 22) to execute software instructions that are stored in memory cells, which couId. be part of an ASIC (Application Specific Integrated Circuit). In fact, the entire microprocessor 22 and. operating software could. be contained within'a single ASIC, al-though a bulk memory storage device would additionally be required in a typical large data quantity system. Of course, other circuitry could be used to implement these logical operations depicted in Figures 2-10 without departing from the principles of the present invention.

1 5 lt will be further understood that the precise logical operations

depicted in the flow charts of Figures 2 through 10, and. discussed. hereinabove, could be sornewhat modified to perform similar, although not exact, functions without departing from. the principles of the present invention. The exact nature of some of the decision steps and.

other commands in these flow charts are directed toward specific types of retail stores, and certainly similar, but sornewliat different, steps would be taken for use with other types of inventory-intensive systems in many instances, although the overall inventive results would be the same.

The foregoing description of a preferred embodiment of the invention has been presented for purposes of illustration and. description. lt is not intended to be exhaustive or to limit. the invention to the precise form disclosed. Obvious modifications or variations are possible in light of the above teachings. The embodiment was chosen and.

described in order to best illustrate the principles of the invention and. its practical application to ---thereby enable one of ordinary skill in the art to best utilize the invention in various embodiments and. with various modifications as are suited to the particular use contemplated. l---t is intended ---that the scope of the invention be defined by the claims appended hereto.

56

Claim

1 A method of using a computer processor to monitor items being received and disbursed within a predetermined enviromnent, characterized by the steps of.

(a) providing a computer monitoring system having a memory circuit for storage of data, a communications port, and a processing circuit;

(b) providing a plurality of sensing circuits that detect at least one item as it is
moved to predetermined locations within said predetermined enviromnent;

0 (e) determining a probability pattern of a velocity of said at least one item as (inverted exclamation mark)t passes one of said plurality of sensing circuits, and storing said
probability pattem in said memory circuit;

(d) receiving, by way of said communications port, identification characteristic information pertaining to said at least one item as it passes
5 one of said plurality of sensing circuits, and receiving time-related information corresponding to when said at least one item was detected by the one of said plurality of sensing circuits; and

(e) comparing an observed velocity of said. at least one item passing one of
said plurality of sensing circuits to said probability pattem, and determining whether or not said observed velocity is anoinalous, and if so
generating a velocity event announcement that said observed velocity is one of- (i) occurring too slowly, or (ii) occurring too quickly.

2 The method as recited in claim 1, wherein the step of determining a probability pattem of a velocity of said at least one item occurs during a Leaming Mode of operation
of said computer monitoring system; or
wherein the step of storing said probability pattem in said memory circuit includes: creating or modify(inverted exclamation mark)ng an entry in a database that is stored in said memory circuit such that said

entry can later be accessed in substantially real time upon the oecurrence of the step of comparing an observed velocity to said probability pattem; or
57
wherein. said identification characteristic information includes: an SKU identifier of said at least one item, or a bar code from a label affixed to said at least one item; or whercin the step of comparing an observed velocity to said probability pattem occurs substantially in real time with respect to the occurrence of said step of receiving identification characteristic information pertaining to said at least one item as (inverted exclamation mark)t passes one of said plurality of sensing circuits, during a Detection Mode of operation of said computer monitoring system; or
wherein the step of receiving identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits occurs when said at least one item, is being sold at a point-of-sale register within said predetennined environment, during a Detection Mode of operation of said computer monitoring system.

3 The method as recited in claim 2, wherein the step of generating a velocity event announcement when said observed velocity is oceurring too slowly is indicative of one of the following conditions: (i) said at least one item is substantially hidden while residing in its correct location on a display shelf; (ii) said at least one item is completely out~of-stock on said display shelf; (iii) said at least one item has been placed at an incorrect location within said predetennined environment, or (iv) access to said at least
one item has been substantially prevented by an obstruction; or
wherein said step of determining whether or not said observed velocity is anomalous includes comparing the observed velocity of said at least one item to a probability velocity model for said at least one item, while taking into consideration at least one of the following factors: varying price conditions, time of day, day of week,
week of year, promotion activities, or competitive activities; or
wherein said step of determining whether or not said observed velocity is anomalous includes comparing the observed velocity of said at least one item to a probability velocity model for said at least one item, while taking into consideration a
usage history of items being disbursed and. received; or
wherein said. step of determining whether or not said observed velocity is anomalous includes comparing the observed velocity of said at least: one item. to a probability velocity model for said at least one item, while taking into consideration at
58
least one of the following factors: varying price conditions, time of day, day of week, week of year, promotion activities, or competitive activities, and said Detection Mode of operation and. said Learning Mode of operation occur simultaneously to refine said probability velocity model for said at least one itein, and fiarther to detect a new item event and to begin creating a probability velocity model for any such new iteni; or further including generating an out-of-stock declaration for one of said at least one item. in advance of an actual store-out-of-stock condition for that item when said observed velocity is oceurring too quickly in addition to other predetermined circuinstances.

4 An item velocity monitoring system, characterized by:
(a) a plurality of sensing circuits that detect at least one item as ft is moved to
predetermined locations within a predetermined envirom-nent;
(b) a computer monitoring system, including:

1 5 (i) a nieniory circuit for storage of data, said memory circuit containing a quantity- of random access memory (RAM) and. a bulk memory storage device;
(ii) a cominunications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and
(iii) a processing circuit that is configured to control the flow of data between said memory circuit and. said comiminications port;
(c) said processing circuit also being configured to:
(i) determine a probability patterri of a velocity of said at least one item as (inverted exclamation mark)t passes one of said plurality of sensing circuits, and to
store said probability pattem in said meniory circuit;
(ii) receive identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits, and to receive time-related infonnation corresponding to when said at least one item was detected by the one of said plurality of sensing circuits; and
59
(iii) compare an observed velocity of said at least one item passing one of said plurality of sensing circuits to said probability pattern, and to determine whether or not said observed velocity is anomalous, and if so to generate a velocity event announcement that said observed velocity is one of. (i) occurring too slowly, or (ii) occurring too quickly.

5 The item velocity monitoring system as recited in claim 4, including a pointof-sale controller that is in communication with said plurality of sensing circuits and with
said communications port; or
wherein said predetennined environment includes a retail store; or
wherein said predetermined environment includes a warehouse; or
wherein said predetennined environment includes a manufacture's distribution center.
15,

6 A method of using a computer processor to analyze velocity pattems of movement of items being received and disbursed within a predetermined environment, characterized by the steps of.
(a) providing a computer monitoring system having a memory circuit for storage of data, and a processing circuit;
(b) receiving data pertaining to at least one transaction involving at least one
item of inventory in said predetermined environment; and
(c) using a dynamically determined probability pattern of a velocity of said at. least one item, after said at least one transaction to determine whether an observed velocity is one of. (i) occurring too slowly, or (ii) oecurring too quickly.

7 The method as recited in claim 6, wherein said dynamically determined probability pattem is stored in said memory circuit and uses a statistical model to predict
a probability of inter-arrival times of said at least one item; or
60
wherein said dynarnically determined probability pattem is stored in said memory circuit and uses a statistical model to predict a probability of inter-arrival times of said at least one item, and. wherein said statistical model includes a modified Poissori
distribution; or
wherein. said dynamically determined probability pattem is stored in said memory circuit and. uses a statistical model to predict a probability of

inter-arrival times of said at least one item, and detecting an Out-of-Stock Event using a probability of observing zero sales of said at least one item. since a last observed sale of that item; or wherein the velocity of said at least one item. includes two random variables, 1 0 inter-arrival time and quantity, which are linked together as a renewal-reward process, in which the quantity of an item is a separate random log-normal variable with a mean beta and a beta variance, and. wherein said inter-arrival time comprises a modified Poisson distribution. 1 5 S. The method as recited in claim. 7, wherein. said Out-of-Stock Event involves a time interval during which said at least one item appears to be physically out-of-stock, and. upon. the occurrence of said Out-of-Stock Event the computer monitoring system suramarizes events, including fast events and slow events, determines their causes, and
measures their impacts; or
wherein said computer monitoring system provides forecasting of inventory or replenishment levels that removes effects of stock-outs before generating forecasting
reports; or
wherein. said dynamically determined probability pattem is determined by training said computer monitoring system by use of one of. (i) historical transaction data,
or (ii) transaction data that is gathered in substantially real time; or
wherein. said dynarnically determined probability pattern. is determined by training said computer monitoring system by use of one of. (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time and said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table or
ltem Table; or
61
wherein said dynarnically determined probability pattem is determined by training said computer monitoring system by use of one of- (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time and said training of the computer monitoring system oceurs in a plurality of iterative passes to create: a Final Base Lambda. Table, a Final Adjustrnent Alpha Table, a Store Table, and a UPC Table or Item Table, and said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table or Item. Table are used to calculate a probability distribution for an inter-arrival interval between sales of said at least one item, and wherein said interarrival interval is stated either in units of- (i) time, or (ii) quantity of sales in monetary
1 0 units; or
wherein said mean and variance parameters to the renewal-reward process are not
constants, but vary during the inter-arrival time as effects change; or
further including: detecting a slow event using a probability of observing more than K sales of said at least one item in the time actually observed for K arrivals of that
item; or
1 5
ftirther including: detecting a fast event using a probability of observing less than J sales of said at least one item. in the time actually observed for J arrivals of that item.

9 The method as recited in claim 8, wherein store sales or category sales are used to measure time in said modified Poisson distribution for inter-arrival times; or wherein store sales or category sales are used to

measure time in said modified Poisson distribution for inter-arrival times and a choice is made whether to use store or category sales for time via standard deviations and standard errors for variables Lambda-1 and Lanibda-2 of said modified Poisson distribution; or wherein store sales or category sales are used to measure time in said modified Poisson distribution for inter-arrival times, and wherein a Poisson parameter lambda is a function of Base Lambda and Adjustment Alpha, which include infonnation as saved data and lookup tables on: SICU, store, and various effects, including price point, promotion, season, holiday, time-of-day, day-of-week, and market conditions; or wherein store sales or category sales are used to measure time in said modified Poisson distribution for inter-arrivaitimes, and wherein a Poisson pararneter lambda is a
62
function of Base Lambda and Adjustment Alpha, which include information as saved data and lookup tables on: SKU, store, and various effects, including price point, promotion, season, holiday, time-of-day, day-of-week, and market conditions, and wherein a median is used to estimate said Lambda model parameter, thereby reducing bias in an estimate of a true Lambda parameter arising from. a contaminating effect of historical out-of-stock events.

10 A method of using a computer processor to analyze velocity pattems of movement of items being reccived and disbursed within a predetermined environment characterized by the steps of
(a) providing a computer monitoring system. having a memory circuit for storage of data, and a processing circuit; and
(b) automatically training said computer monitoring system using either historical data or data gathered in substantially real time, thereby leaming 1 5 item velocities for a plurality of items. 1 1. The method as recited in claim 1 0, wherein said item velocities vary as a ftmetion of. total predetermined environment velocity, time of day, day of week, season,
holidays, and market conditions of said predetermined environment; or wherein said predetermined environment includes one of. a retail store, a chain of retafis stores, a warehouse, a chain of warehouses, a distribution point, or a chain of
distribution points; or
"her including the step of automatically re-training said computer monitoring systera on a periodic basis using substantially real time data throughout a periodic
interval; or
wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

12 The method as recited in claim 1 1, wherein said iterative passes include the steps of. (i) computing Initial Base Lambdas using total store sales and total category
63
sales; (ii) computing Intennediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustinent Alphas using an adjusted item inter-arrival time and a plurality of current effeas; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and. said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current
effects, and computing a Beta Table; or
wherein said iterative passes fulther include the steps of. (i) computing

Initial Base Lambdas using total store sales and total category sales; (ii) computing Intennediate Base Lambdas using item transaction data and said itern@s inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table, and wherein said Final Base Larabda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution for an inter-arrival interval between sales of said at least one item, and wherein said inter-arrival interval is stated either in units of. (i) time, or (E) quantity of sales in monetary units.

13 A computerized method to determine the cause of out-of-stock events in a predetennined environment, characterized by the steps ofreceiving data pertaining to transactions involving items of inventory in said predetenuined enviromnent;
detecting a plurality of out-of-stock events for at least one item of inventory, each
out-of-stock event having associated attributes; and
determining automatically the cause of at least one out-of-stock event based upon the auributes associated therewith.
64
. The method as recited in claim 13, wherein detelmining that an out-of-stock event exists nirther includes the step of analyzing said at least one item's predetennined
probability pattem of velocity; or
wherein determining automatically the cause of the at least one out-of-stock event includes the steps of- (a) analyzing the plurality of out-of-stock events according to an automated induction software algoriflun to identify discovered attribute sets, and (b) matching attributes associated with the at least one out-of-stock event with a discovered
attribute set; or
wherein detennining automatically the cause of the at least one out-of-stock event includes the steps of- (a) analyzing the plurality of out-of-stock events according to an automated induction software algorithm to identify discovered attribute sets, and (b) matching attributes associated with the at least one out-of-stock event with a discovered attribute set, and (e) wherein analyzing the plurality of out-of-stock events includes: (i) analyzing a plurality of att:ribute sets comprised of respective combinations of the attributes associated with at least some of the out-of-stock events, (ii) detemiining, for each attribute set, a probability for at least one of the duration of each out-of-stock event having the combination of attributes that forin the respective attribute set, the frequency of the out-of-stock events having the combination of attributes that fonn the respective attribute set, and the loss associated with each out-of-stock event having the combination of auributes that forin the respective attribute set, and (iii) detemiining instances in which the probability is outside of a range of nonnal probabilities to thereby indicate at least one of an abnonnally high service level and an abnormally low service level, wherein the attribute sets for which the associated probabilities are outside of a range of
normal probabilities are discovered attributes sets; or
wherein determining automatically the cause of the at least one out-of-stock event comprises matching attributes associated with the at least one out-of-stock event with at least one of a plurality of standard

attribute sets.

15 The method as recited in claim 14, wherein matching auributes includes a step of correlating out-of-stock events for an item across retail outlets; or
65
wherein matching auributes includes the steps of correlating out-of-stock events for an item across retail OutIets, and correlating out-of-stock events for an item. across retail outlets includes correlating out-of-stock events for an item with at least one of store planogram type, store type and. size of shelf spacing; or
wherein matching attributes includes the step of correlating out-of-stock events
occurring within a period. of time across retail outlets; or
wherein matching attributes includes the step of identifying out-of-stock events
for item.s that are being sales promoted; or
wherein. matching attributes includes the step of identifying out-of-stock events
0 for items that are being price-reduced; or
wherein. matching attributes includes the step of correlating the time of the onset
of an out-of-stock event with the commencement of a sales promotion; or
wherein matching attributes includes the step of correlating the time of the onset
of an out-of-stock event with the commencement of a price-reduction; or
5 wherein matching attributes includes the step of identifying the quantity of out
of-stock events for a retail outlet- or
wherein. matching attributes includes the step of correlating out-of-stock evenis to a time attribute chosen from the group consisting of day of the week, time of the day and time of the year.

16 A system for determining the cause of an out-of-stock event, characterized
by:
a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment; and.
a computer monitoring system, including:
a memory circuit for storage of data,
a communication port in communication with at least one of said sensing circuits and said memory circuit; and
a processing circuit that is configured to control the flow of data between said memory circuit and said communication port,.
66
wherein said processing circuit is configured to receive data pertaining to transactions involving items of inventory in said predetermined environmentP detect a plurality of out-of-stock events for at least one item of inventory wherein each out-ofstock event has associated auributes, and determine automatically the cause of at least one out-of-stock event based upon the auributes associated therewith.

17 The system as recited in claim 16, wherein said processing circuit, in determining automatically the cause of the at least one out-of-stock event, analyzes the plurality of out-of-stock events according to an automated induction software algorithm to identif`y discovered auribute sets, and matches attributes associated with the at least
one out-of-stock event with a discovered attribute set; or
wherein said processing circuit, in deterinining automatically the cause of the at least one out-of-stock event, analyzes the plurality of

out-of-stock events aecording to an automated induction software algorithm to identify discovered attribute sets, and matches 1 5 attributes associated with the at least one out-of-stock event with a discovered attribute set, and wherein said processing circuit, in analyzing the plurality of out-of-stock events, analyzes a plurality of attribute' sets comprised of respective combinations of the attributes associated with at least some of the out-of-stock events, determines, for each attribute set, a probability for at least one of the duration of each out-of-stock event having the combination of attributes that form the respective attribute set, the frequency of the out-of-stock events having the combination of attributes that form the respective attribute set, and the loss associated with each out-of-stock event having the combination of attributes that form the respective auribute set, and determines instances in which the probability is outside of a range of nonnal probabifities to thereby indicate at least one of an abnormally high service level and an abnormally low service level, wherein the auribute sets for which the associated probabilities are outside of a range of normal
probabilities are discovered attributes sets; or
wherein. said processing circuit, in determining automatically the cause of the at least one out-of-stock event, analyzes the plurality of out-of-stock events according to an automated induction software algorithm to identif`y discovered attribute sets, and matches attributes associated with the at least one out-of-stock event with a discovered attribute
67
set, and wherein said processor, in deterinining automatically the cause of the at least one out-of-stock event, matches attributes associated with the at least one out-of-stock event with. at least one of a plurality of standard attribute sets.
18 A computerized method for detennining customer impact occasioned by an out-of-stock event, characterized by the steps of.
identifying each, of a plurality of customers;
correlating current out-of-stock events to each customer's purchasing event;
analyzing historical purchasing data for each customer;
0 estimating, for cach customer, an expected purchase amount for at least one out
of-stock item based upon the historical purchasing data; and
analyzing, for each customer, actual purchases during the customer's purchasing event relative to the estimated expected purchase amount. for the at least one out-of-stock item.
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19 The method as recited in claim 1 8, ftirther including the step of determining that a substitute item has been purchased by said customer in lieu of purchasing an out
of-stock item; or
flirther including the step of determining that a substitute item has been purchased by said customer in licu of purchasing an out-of~stock item, wherein said deterinining that a substitute item has been purchased includes the step of assessing the amount of said substitute item purchased in excess of an estimated expected purchase
amount of the substitute item; or
flirther including the step of detennining that a substitute item has been purchased. by said customer in lieu of purchasing an out-of-stock item, wherein. said substitute item comprises a substitute: item having the same brand as the out-of-stock
item; or
further including the stepi of detennining that a substitute item has

been purchased by said customer in lieu of purchasing an out-of-stock item, wherein said substitute item comprises: a substitute item having a different brand than the out-of-stock
item; or
68
further including the step of detennining that a purchase of an out-of-stock item
has been delayed; or
further including the step of detennining that an out-of-stock item has resulted in
a lost sale to the retafier; or
flirther including the step of estimating customer reaction to an out-of-stock event for a predetermined item.
20 The method as recited in clairu. 19, wherein determining that a purchase of an out-of~stock item has been delayed includes the steps of. subtracting the expected 0 purchase amount on a subsequent purchasing event of an item currently out-of-stock from the actual purchase amount of the item on a subsequent purchase event and
determining that the difference exceeds zero; or
further including the steps of. detennining that an out-of-stock item has resulted in a lost sale to the retailer, and wherein said detennining that an out-of-stock item has 5 resulted in a lost sale further includes the steps of. subtracting the expected purchase amount on a subsequent purchasing event of an item currently out-of-stock from the actual purchase amount of the item on a subsequent purchase event aud
determining that
the difference is less than zero; or
further including the steps of estimating customer reaction to an out-of-stock event for a predetennined item, and wherein said customer reaction to stock outs is used as the basis for measuring loyalty to specific items, brands, stores, and store chains; or farther including the steps of estimating customer reaction to an out-of-stock event for a predetennined item, and wherein said customer reaction to stock outs is used as the basis for measuring loyalty to specific items, brands, stores, and store chains, and wherein said customer reaction to stock outs comprises one of the following: switching to another item of the same brand; switching to an item of another brand; delaying
purchase of the original item; or loss of sale; or
wherein said customer reaction farther includes an impact event chosen from the group consisting of- switching to another brand, switching to the same brand, delaying
the purchase, or losing the sale; or
69
wherein said customer reaction further includes an impact event chosen ftom, the group consisting of. switching to another brand, switching to the same brand, delaying the purchase, or losing the sale, and wherein estimating customer reaction to an out-ofstock event includes the step of detennining item loyalty (IL), as follows:
IL = SL +jSB + kSD
wherein SL is a percentage of sales of the item that was out-of-stock that were lost during the out-of-stock event, SB is a percentage of sales of the item that was out-ofstock that switched to sales of another item of the same brand during the out-of~stock event, SI) is a percentage of sales of the itern. that was out-of-stock that were delayed 1 0 during the out-of-stock event, and j and k are constants.

21 The method as recited in clairn. 20, further including the step of detennining brand loyalty based upon an average across all. items of a brand of the respective item
loyalties; or

further including the step of determining store loyalty by averaging (I-SL) for all items.

22 A systein for detennining the impact of an out-of-stock event, characterized
by:
a plurality of sensing circuits that detect at least one item as it is moved to
predetermined locations within a predetennined environment; and
a computer monitoring system, including:
a memory circuit for storage of data,
a communication port in communication with at least one of said sensing circuits and said memory circuit; and
a processing circuit that is configured to control the flow of data between
said mernory circuit and said communication port,
wherein said processing circuit is configured to identify each. of a plurality of customers, to correlate current out-of-stock events to each. customer's purchasing event, 3 0 to analyze historical purchasing data for each. customer, to estimate, for each customer, an expected purchase amount for at least one out-of-stock item based upon the historical
70
purchasing data, and. to analyze, for each customer, actual purchases during the customer's purchasing event relative to the estimated expected purchase amount for the at least one out-of-stock item.

23 The system as recited in claim 22, wherein said processing circuit also determines that a substitute item. has been purchased by said customer in Heu. of
purchasing an out-of-stock item; or
wherein said processing circuit also detennines that a purchase of an out-of-stock
item has been delayed; or
wherein said processing circuit also detennines that an out-of-stock item has
resulted in a lost sale to the retailer; or
wherein said processing circuit also estirnates customer reaction to an out-of
stock event for a predetermined item; or
wherein said processing circuit also estirnates custorner reaction to an out-ofl 5 stock event for a predetennined item, and said processing circuit estirnates customer reaction to an out-of-stock event by detennining item loyalty (IL) as follows:
IL = SL +jSB + kSD
wherein SL is a percentage of sales of the item that was out-of-stock that were lost during the out-of-stock event, SB is a percentage of sales of the item that was out-ofstock that switched to sales of another item of the sarne brand during the out-of-stock event, SD is a percentage of sales of the item that was out-of-stock that were delayed during the out-of-stock event, and j and. k are constants.

24 The system according to claim 23, wherein. said processing circuit also determines brand loyalty based upon an average across all items of a brand of the
respective item, loyalties; or
wherein said processing circuit also detennines brand loyalty based upon an average across all items of a brand of the respective item loyalties, and. herein said 3 0 processing circuit also detennines store loyalty by averaging (1 -SL) for all items.
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. An item. velocity monitoring system, characterized by:
(a) a plurafity of sensing circuits that detect at least one item as (inverted exclamation mark)t is moved to
predetermined locations within a predetermined environment;
(b) a computer monitoring system, including:
(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a
bulk memory storage device;
(ii) a communications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and
1 0 (iii) a processing circuit that is configured to control the flow of data
between said memory circuit and said communications port;
(c) said processing circuit also being configured to:
(i) receive data pertaining to at least one transaction involving at least
one item of inventory in said predetermined environment; and
1 5 (ii) dynamically determine probability pattem of a velocity of said at
least one item, after said at least one transaction to determine whether an observed velocity is one of. (i) occurring too slowly, or'
(fi) oceurring too quickly.

26 The item velocity monitoring system. as recited in claim 25, wherein said dynamically determined probability pattem is stored in said memory circuit and uses a statistical model to predict a probability of inter-arrival. times of said at least one item; or wherein said processing circuit is fiarther configured to detect an Out-of-Stock Event using a probability of observing zero sales of said at least one item since a last
observed sale of that item; or
wherein said processing circuit is flirther configured to detect an Out-of-Stock Event using a probability of observing zero sales of said at least one item since a last observed sale of that (inverted exclamation mark)tem, and said Out-of-Stock Event comprises a time interval during which said at least one (inverted exclamation mark)tem appears to be physically out~of-stock, and upon the occurrence of said Out-of-Stock Event the computer monitoring system summarizes
events, determines their causes, and measures their impacts; or
72
wherein said dynamically detennined probability pattem is detennined by training said computer monitoring system by use of one of. (i) historical transaction data,
or (ii) transaction data that is gathered in substantially real time; or wherein the velocity of said at least one item includes two random variables, inter-arrival time and quantity, which are linked together as a renewal-reward process, in which the quantity of an item is a separate random log-nonnal. variable with a mean beta and a beta variance, and wherein said inter-arrival time comprises a modified Poisson distribution. 1 0 27. The item velocity monitoring system as recited in claim 26, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a
UPC Table; or
wherein said training of the computer monitoring system occurs in a plurality of 1 5 iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a. Store Table, and a UPC Table, and said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution., for an inter-arrival interval between sales of said at least one item, and

wherein said inter-arrival interval is stated either in units of. (i) time, or (ii) quantity of sales in monetary units.

28 An item velocity monitoring system, characterized by:
(a) a plurality of sensing circuits that detect at least one item as it is moved to
predetermined locations within a predetermined enviroinment;
(b) a computer monitoring system, including:
(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a
bulk memory storage device;
(ii) a communications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and
73
(iii) a processing circuit that is configured to control the flow of data between said memory circuit and said communications port; and is further configured to automatically train said computer monitoring system using either historical data or data gathered in substantially real time, thereby leaming item, velocities for a plurality of items.

29 The item velocity monitoring system as recited in claim 28, wherein said item velocities vary as a fimction of. total predetermined environment velocity, time of day, day of week, season, holidays, and market conditions of said predetermined
enviroinment; or
wherein said predetennined enviromnent includes one of. a retail store, a chain of retails stores, a warehouse, a chain of warchouses, a distribution point, or a chain of
distribution points; or
wherein said processing circuit is further configured to automatically re-train said computer monitoring system on a periodic basis using substantially real time data
throughout a periodic interval; or
wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

30 The item velocity monitoring system as recited in claim 29, wherein said iterative passes include: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Inifial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said itern's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Latnbdas and a plurality of current
effects, and computing a Beta Table; or
wherein said iterative passes include: (i) computing Initial Base Lambdas using total store sales and total category sales; (E) computing Intermediate Base Lambdas
74
using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter~ arrival time; and. (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table, and wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store

Table, and UPC Table are used to calculate a probability distribution for an inter-arrival interval between. sales of said at least one item, and. wherein said inter-arrival interval is stated either in units of. (i) time, or (ii) quantity of sales in monetary units.
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5/9/99 (Item 19 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00485350 **Image available**
FUEL DISPENSING SYSTEM WITH PREPAYMENT MEANS LINKED TO A TRANSPONDER
SYSTEME DE DISTRIBUTION DE CARBURANT A MOYENS DE PREPAIEMENT EN ASSOCIATION AVEC UN TRANSPONDEUR
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Patent and Priority Information (Country, Number, Date):
Patent: WO 9916702 A1 19990408
Application: WO 98GB2915 19980928 (PCT/WO GB9802915)
Priority Application: US 9760066 19970926; US 9835158 19980305
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Main International Patent Class: B67D-005/14
Publication Language: English
Fulltext Word Count: 27099

English Abstract
The present invention provides a fueling system for conducting a transaction with a prepaid remote communication unit. The system includes wireless communication electronics for communicating with a remote communication unit, a dispenser and customer interface for conducting a transaction, prepayment means and a control system. The control system is adapted to determine a value correlating to the prepayment made by a customer at the prepayment means, effects storage of the value in association with the remote communication unit, communicate with the remote communications unit subsequent to effecting storage of the value and deduct the value of an amount of a transaction associated with the communications unit to effect payment.

French Abstract
Cette invention a trait a un systeme de ravitaillement en carburant permettant de mener une transaction au moyen d'une unite de telecommunication de prepaiement. Ce systeme comporte des equipements electroniques de communication sans fil autorisant une communication avec une unite de telecommunication, une interface distributeur-client permettant de mener une transaction, des moyens de prepaiement et un systeme de commande. Ce dernier, qui est concu pour determiner une valeur en correlation avec le prepaiement effectue par le client sur les moyens

de prepaiement, memorise cette valeur en association avec l'unite de telecommunication, entre en communication avec celle-ci une fois l'operation de memorisation achevee et deduit la valeur d'un montant d'une transaction en association avec l'unite de telecommunication afin d'effectuer le paiement.

Detailed Description

FUEL DISPENSING SYSTEM WITH PREPAYMENT MEANS LINKED TO A TRANSPONDER

The present invention relates generally to fuel dispensers and, more particularly, to fuel dispensers and systems capable of communicating with various types of transponders and detecting their movement within and throughout a fueling environment.

In recent years, traditional gasoline pumps and service stations have evolved into elaborate point-of-sale (POS) devices having sophisticated control electronics and user interfaces with large displays and touch-pads or screens. The dispensers include various types of payment means, such as card readers and cash acceptors, to expedite and further enhance fueling transactions. A customer is not limited to the purchase of fuel at the dispenser. More recent dispensers allow the customer to purchase services, such as car washes, and goods, such as fast food or convenience store products at the dispenser. Once purchased, the customer need only pick up the goods and services at the station store or the outlet of a vending machine.

Remote transaction systems have evolved wherein the fuel dispenser is adapted to cominunicate with various types of remote communication devices, such as transponders, to provide various types of identification and information to the fuel dispenser automatically. Given the sophistication of these transaction systems and the numerous choices provided to the customer at the dispenser, conducting transactions with transponders will be useful to allow the dispenser and fuel station store to monitor the movement of a person cam 7ing a transponder and a vehicle having a transponder, enhance transaction and marketing efficiencies. and improve safety in the fueling environment.

The present invention provides a system and method for implementing a prepaid transponder capable of being used with dispensers and other POS terminals -in a fueling envirom-nent. The invention allows a customer to prepay for subsequent transactions at a terminal capable of communicating with the transponder in order to store the amount of prepayment on the transponder or at least associate the amount of prepayment in a database associated with the terminal and any future transaction locations, such as a fuel dispenser.

In one aspect the invention provides a fueling system operable to conduct a prepayment transaction with a remote communication unit said system comprising.

a. a wireless communication arrangement for communicating with said remote
communication unit;
b. a dispenser and customer interface for conducting a transaction;
C. a prepayment means;
d. a control system associated with said communication arrangement and said dispenser;
e. said control system being adapted to
L determine a value correlating to a prepayment made by a customer at the prepayment means;
ii. effect storage of said value in association with the remote

communication unit; iii. communicate with the remote communication unit subsequent to effecting
storage of the value; and
iv. deduct from the value an amount of a transaction associated with the remote communication unit to effect payment.

The value rnav be stored in a memorv accessible by said control system and apart from said remote communication unit, said value being stored in association with the remote communication unit.

The control system may transmit said value to the remote communication unit for storage via said communication arrangement.

Preferably the value stored for the remote communication unit is added to any prior value associated with the remote communication unit.

The control system may be adapted to alert a customer via said interface when the value stored in association with the remote communication unit is less than a predefined amount.

Further said control system may be adapted to alert a customer via said interface when the value stored in association with the remote communication unit is zero.
Still further said control system may be adapted to alert a customer via said interface when the value stored in association with the remote communication unit is less than a transaction total.

Said prepayment means may be a card reader associated with a card authorization network; the card reader may be apart from the dispenser or included in the interface.

Further said prepayment means may be a cash acceptor e.g. apart from the fuel dispenser or included in the interface.

The prepayment means may be an operator terminal apart from said fuel dispenser.

The system preferably comprises a transponder which stores data relating to prepayments effected.

Thus the invention provides a fueling system for conducting a transaction with a prepaid remote communication unit. The system preferably includes wireless communication electronics for communicating with a remote communication unit, a dispenser and customer interface for conducting a transaction, prepayment means and a control system. The control system is adapted to detennine a value correlating to the prepayment made by a customer at the prepayment means, effects storage of the value in association with the remote communication unit, communicate with the remote communications unit subsequent to effecting storage of the value and deduct the value of an amount of a transaction associated with the communications unit to effect payment. The value may be stored in a memory accessible by the control system and apart from the remote communications unit, or directly on the remote communications unit.

When the value is not stored on remote communication unit, the value is stored using a unique identification indicia received from the remote communications unit. The value stored in association with the remote communications unit is preferably added to any prior value associated with that unit. The control system may be adapted to alert a customer via the customer interface when a value stored in association with the

communications unit is less than a predefined amount, zero or less than the transaction total.

Prepayment means may be a card reader associated with a card authorization network, either at the fuel dispenser or in the fuel station store at any number of fuel station environments, or a cash acceptor located in similar fashion as the card reader. Generally, the prepayment means is an operator ten-ninal apart from the fuel dispenser and associated with a convenient store operator terminal. In operation, a customer will simply go into a store or approach a dispenser to have value credited to his transponder. This value is added to any value in the transponder or associated with the transponder and will be used to pay for future transactions. Notably, the control system in this system may include a dispenser controller, a central controller, or a remote network system or a combination thereof Generally, a control system will have various branches to receive prepayment at one position and accept payment from another location. This specification and any claims that follow should be construed in this manner.

The invention preferably includes the steps of receiving a value at a prepayment means, storing the value in association with a remote communications unit and subsequently communicating with the remote communications unit at a fuel dispenser during a fueling transaction. A totaling of any products or services subject to the transaction to determine a payment amount, which is deducted from the value stored in association with the remote communications unit. This value may be stored on a remote communication unit or in a database accessible by a corresponding control system having a remote communications unit identification indicia.
These and other aspects of the present invention will become apparent to those skilled in the art after reading the following description of the preferred embodiments when considered with the drawings.

Brief Description of the Drawings
FIGURE I is a schematic representation of a fueling and retail environment constructed according to the present invention.

FIGURE 2A depicts a vehicle having a vehicle-mounted transponder constructed according to the present invention.

FIGURE 2B depicts a personal transponder integrated into a debit/credit or smartcard constructed according to the present invention.

FIGURE 2C depicts a personal transponder integrated into key fob constructed according to the present invention.

FIGURE 3 depicts a fuel dispenser shown constructed according to the present invention.

FIGURE 4A is a schematic representation of a transponder having separate communication and cryptography electronics constructed according to the present invention.

FIGURE 4B is a schematic representation of transponder having integrated electronics constructed according to the present invention.

FIGURE 5 is a schematic representation of fuel dispenser electronics constructed according to the present invention.

FIGURE 6 is a schematic representation of convenience store transaction

electronics, including a transaction terminal, for a fueling environment constructed according to the present invention.

FIGURE 7 is a schematic representation of a quick-serve restaurant control system for a fueling environment constructed according to the present invention.

FIGURE 8 is a schematic representation of a car wash control system constructed according to the present invention.

FIGURE 9 is a schematic representation of a central control system for a fueling environment constructed according to the present invention.
FIGURES I OA and I OB are a flow chart representing a basic flow of a multistage ordering process according to the present invention.

FIGURE 10C is a flow chart representing a basic flow of a loyalty benefit process according to the present invention.

FIGURES IIA and 1113 are a flow chart representing a basic interaction with a transponder during a cash transaction according to the present invention.

FIGURE I IC is a flow chart representing a basic process for providing a discount for transponder use during a transaction according to the present invention.

FIGURES I ID and I IE are a flow chart of a basic process for providing prepayment on a transponder for subsequent transactions according to the present invention.

FIGURE 12A is a schematic representation of a side view of a dispenser having multiple antenna arrangements for providing directional interrogation fields constructed according to the present invention.
FIGURE 12B is a schematic representation of a front view of a dispenser having multiple antenna arrangements for providing directional interrogation fields constructed according to the present invention.

FIGURES 12C and 12D are a flow chart of a basic process for monitoring the location and type of transponder at a fueling position according to a preferred embodiment of the present invention.

FIGURE 13A is an overhead schematic representation of a fueling environment having antenna arrangements providing various interrogation fields.

FIGURE 13B is an overhead schematic representation of a fueling environment having antenna arrangements providing continuous location monitoring of transponders in the fueling environment.

FIGURES 14A and 14B are a flow chart of a basic process for deten-nining the proximity or location of a transponder with respect to a particular fueling position at a dispenser according to the present invention.

FIGURE 15 is a flow chart of a basic control process for determining transponder location for an embodiment similar to that depicted in Figure I3 M.

FIGURE 16 is a perspective view of a fuel dispenser having underground antennas constructed according to the present invention.

FIGURE 17 is an overhead schematic representation of a fuel dispenser constructed according to the present invention.

FIGURES 18A and I 813 are a flow chart of a basic process for preconditioning a dispenser followed by secondary transaction authorization according to the present invention.

FIGURE 19 depicts a preferred process for providing secure communications between a transponder and a host network through a fuel dispenser.

FIGURE 20 is a flow chart of a basic transponder interaction for providing theft deterrence and prevention according to the present invention.

FIGURE 21 is a flow chart of a basic transponder interaction for preventing drive-offs according to the present invention.
FIGURE 22 is a flow chart of a basic process for providing guidelines or limitations for a fueling or purchase transaction made in association with a transponder according to the present invention.

FIGURE 23 is a schematic representation of a transponder and dispenser system for providing a shadow ledger of transponder transactions constructed according to the present invention.

FIGURE 24 is a flow chart of a basic rocess for maintaining a shadow ledger according
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to the present invention.

FIGURE 25 is a flow chart of a basic process for transaction **tracking** throughout numerous fueling environments according to the present invention.

FIGURES 26A and 26B are a flow chart of a basic process for providing predefined preferences to a customer during a transaction made in association with a transponder according to the present invention.

FIGURE 27 is a schematic representation of a fuel dispenser and fuel container for personal transport of fuel.

FIGURE 28 is a flow chart of a basic process for monitoring and detecting acceptable containers for fueling.

FIGURES 29A and 29B are a flow chart of a basic process for providing pre-transaction estimates according to the present invention.

FIGU'RE 30 is a flow chart of a basic process for providing a customer with estimated cost totals of a fueling transaction to enable a customer to make an informed decision regarding payment at a cash acceptor of a fuel dispenser.

In the following description, like reference characters designate like or corresponding parts throughout the several figures. It should be understood that the illustrations are for the purpose of describing preferred embodiments of the invention and are not intended to limit the invention thereto.

Given the extensive nature of the present application, an overview of the necessary hardware for the various areas in the fueling environment will be discussed followed by a description of the various functional aspects

of the system and how the customer will react and interact with
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the system during various types of transactions.

As best seen in Figure 1, a fueling and retail environment, generally designated 10, is shown constructed according to the present invention. The fueling and retail environment provides customers 12 the opportunity to purchase fuel for their vehicles 14 as well as other goods and services, such as fast food and car washes. The fueling and retail environment IO may include one or more of a forecourt 16, where the fuel dispensers 18 are located, a convenience or fuel station store 20, one or more quick-serve restaurants (QSR) 22, a car wash 24, and a backroom 26. The backroom 26 is generally the central control area for integrating or coordinating control of the dispensers 18, convenience store 20, QSR 22, and car wash 24.

The convenience store 20 typically includes an inventory of a wide assortment of products, ranging from beverages and foods to household goods. The convenience store includes a transaction terminal or register 30, where a customer 12 may purchase convenience store products, fuel, car washes or QSR food.
The QSR 22 generally includes an order pick-up area 32 having a QSR transaction terminal or register 34 located within the convenience store and a drive-thru terminal and window 36.

Depending on the application, the QSR transaction tenninal 34 and drive-thru terminal 36 may be separated or integrated in any fashion. Usually, customers are able to place orders at the QSR transaction tenninal 34 in the store as well as pick up orders in conventional drive-thru style at drive-thru terminal 36.

The QSR 22 may also include a food preparation area 40, a food preparation interface 42 for
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providing order instruction to QSR food preparers, a drive-thru order placement interface 44 for placing drive-thru orders in a conventional manner, and a customer position monitor 46 for determining the location or position of a customer in line to pick up a QSR order at the drive-thru window 36. Notably, the drive-thm and car wash lanes depicted in Figure I are designed to control the flow of traffic through the respective lanes and aid to ensure vehicles, and their respective transponders, pass by the various interrogation points in the fueling environment as desired.
The car wash 24 includes a car wash interface 48 that interacts with the customer and controls the automatic car wash system (not shown), which may be any suitable automatic car wash.

Preferably, a customer 12 will be able to order a car wash at a fuel dispenser 18, at the transaction terminal or register 30 of the convenience store 20, at the QSR transaction terminal 34, or at the car wash interface 48 directly. Similarly, customers are able to order fast-food items from the QSR 22 from various locations in the fueling environment 1 0, including at the fuel dispensers 18, drive-thru order placement interface 44, and the in-store QSR terminal 34.

Although various overall system and control integration schemes are available, the four major parts of the fueling environment I 0 -- forecourt 16, convenience store 20, QSR 22 and car wash 24 -- typically interface at the backroom 26 using a central control system 50. The central control system 50 may include any number of individual

controllers from the various parts of the fueling environment 10 to provide overall system control and integration. The central control system 50 may interface with the fuel dispensers 18, transaction terminal 30, QSR transaction terminal '34 and the car wash interface 48. Preferably the drive-thru terminal 36, drive-thru order placement interface 44 and customer position monitor 46 directly interface with the QSR tern-iinal 34 in order to integrate the QSR functions prior to interfacing with the central control system 50. However, those of ordinary skill in the art will recognize several control variations capable of implementing an integrated system. Additionally, an automated vending system 28 may also interface with the central control system 50 or directly with any one of the other areas of the fueling envirom-nent 10, such as the fuel dispensers 18, in order to allow a customer 12 to purchase products from the vending system 28 at a remote location.

The present invention relates generally to providing remote communications between the customer 12 or the vehicle 14 and various parts of the fueling environment briefly described above. In short, many areas within the fueling environment 10 will be equipped with communication electronics capable of providing uni- or bi-directional communications with the customer or vehicle carrying a remote communications device. The communication electronics will typically include a transmitter for transmitting signals to the remote communications device and a receiver for receiving signals emanating from the remote communications device. The remote communications device may also include a receiver and transmitter. The transmitter and receiver of the remote communications device may separately receive and separately transmit signals in cooperation with an associated control system or may be configured so that the transmitter actually operates on and modifies a signal received from the communication electronics in the fueling environment 10. The latter embodiment encompasses traditional transponder-type communication systems wherein the remote communications device may be either passive or active.

For the sake of conciseness and readability, the term "transponder" will be used herein to describe any type of remote communications device capable of communicating with the communication electronics of the fueling environment 10. The remote communications device may include traditional receivers and transmitters alone or in combination as well as traditional transponder electronics adapted to respond and/or modify an original signal to provide a transmit signal. A transponder as defined herein may provide either unidirectional or bidirectional communications with the communications electronics of the fueling environment 10.

Likewise, the communication electronics associated with the various aspects of the fueling envirom-nent 10 will be called an "interrogator." An interrogator will generally include a transmitter and receiver capable of communicating with a transponder as defined above. Please note that an interrogator, as defined herein, need not contain both a receiver and a transmitter for various aspects of the invention.

With the above in mind, the fueling environment 10 may include many interrogators of varying capability. These interrogators may include: dispenser interrogators 52, a store transaction interrogator 54, a QSR transaction interrogator 56, a drive-thru pick-up interrogator 58, a drive-thru order interrogator 60, and a drive-thru position interrogator 62. As shown in Figures 2A, 2B and 2C, the dispenser interrogator 52 is generally adapted to communicate with vehicle-mounted transponders 64 and personal transponder 66. The personal transponder 66 may be mounted on a key fob 68, a wallet card 70, or any other device typically carried by

the customer 12, as shown in Figures 2B and 2C. Figure 2A depicts a vehicle 14 having a vehicle-mounted transponder 64.

The levels of sophistication of the vehicle-mounted transponder 64 may vary drastically. The
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transponder 64 may be integrated with the vehicle's main computer and control system, or may simply be a sticker placed on a window or on another part of the vehicle. The transponder 64 may be active or passive, and may be adapted to either simply send out an identification number or carry out high-level communications and have the ability to process, store and retrieve information. Various features of the invention will be disclosed in greater detail.

As best seen in Figure 3, a fuel dispenser 18 is shown constructed according to and as part of the present invention. The dispenser provides a fuel delivery path from an underground storage tank (not shown) to a vehicle 14, (shown in Figures I and 2A). The delivery path includes a fuel delivery line 72 having a fuel metering device'174. The fuel delivery line 72 communicates with a fuel delivery hose 76 outside of the dispenser 18 and a delivery nozzle 78. The nozzle 78 provides manual control of fuel delivery to the vehicle 14.

The dispenser 18 also includes a dispenser control system 80 having one or more controllers and associated memory 82. The dispenser control system 80 may receive volume data from the metering device 74 through cabling 84 as well as provide control of fuel delivery. The dispenser control system 80 may provide audible signals to an audio module and speaker 86 in order to provide various beeps, tones and audible messages to a customer. These messages may include warnings, instructions and advertising.

The dispenser 18 is preferably equipped with a payment acceptor, such as a card reader 88 or cash acceptor 90. alonpr with a receipt printer 92. With these options, the dispenser control system 80 may read data from the magnetic strip of a card inserted in the card reader 88 or receive cash from a customer and communicate such information to the central control system 50 (as shown in Figure 1), such as the G-site controller sold by Gilbarco Inc., 7300 West Friendly Avenue, Greensboro, North Carolina. The central control system 50 typically communicates with a remote network 94, such as a card verification authority, to ascertain whether a transaction proposed to be charged to or debited from an account associated with the card inserted in the card reader 88 is authorized.

The dispenser 18 will include one or more types of displays, preferably one or more alpha-numeric displays 96 together with a high-resolution graphics display I 00. The graphics display 100 will generally have an associated key pad 102 adjacent to the display or integrated with the display to provide a touch interface. The dispenser may include an additional, auxiliary key pad 104 associated with the card reader 88 for entering secret codes or personal identification numbers (PINs). Notably, the displays 96, 100 and key pads 102, 104 may be integrated into a single device and/or touch interface. The dispenser control system 80 is preferably comparable to the microprocessor-based control systems used in CRIND (card reader in dispenser) and TRIND (tag or transponder reader in dispenser) type units sold by Gilbarco Inc. under the trademark TBE ADVANTAGE.

As noted, the dispenser control system 80 may include or be associated

with dispenser communication electronics referred to as interrogator 52 for providing remote unidirectional or bidirectional communications between a transponder and the dispenser. These transponders may incorporate the Micron Microstamp T"' produced by Micron Communications, Inc., 8000 South Federal Way, Boise, Idaho 83707 The Micron Microstarnp T' engine is an integrated system implementing a communications platform referred to as the Microstamp TM standard on a single CMOS chip. A detailed description of the Microstamp ""engine and the method of communication is provided in its data sheets in the Micron Microstamp TI Standard Programmers Reference Manual provided by Micron Communications, Inc. These references and the information provided by Micron Communications on their web site at http://www.mncc.micron.com are incorporated herein by reference. Although the preferred communications method includes radio frequencies in the microwave range, these communications may include other RF, infrared, acoustic or other known remote communication methods acceptable for use in a fueling environment. Additionally, the dispenser 18 may include one or more antennas 108 associated with the dispenser interrogator 52.

Attention is drawn to U.S. Patent Nos. 5,621,913; 5,608,739; 5,583,850; 5,572,226; 5,558,679; 5,557,780; 5,552,743; 5,539,775; 5,500,650; 5,497,140; 5,479,416; 5,448,1 10; 5@3651551; 5,323,150 and 5,302,239, owned by Micron Technology, Inc. the disclosures of which are incorporated herein by reference.

Turning now to Figure 4A, the preferred embodiment of a transponder is shown. Transponder communication electronics I IO, adapted to provide remote communications with the various interrogators, include a transmitter 1 14 and receiver I 1 6 having associated antennas I 1 8, 120.

The transmitter 114 and receiver 116 operate to transmit and receive data to and from an interrogator. The communication electronics II 0 may include a battery power supply 122, a communication controller 124 associated with a memory 126, having software 128 necessary to operate the communication electronics II 0 and optional cryptography electronics 1 12.

Serial communications between the communication electronics I 10 and cryptography electronics 112 is provided via the input/output (1/0) ports 130, 140 associated with the respective electronics. The communication electronics I 10 provide a signal from a clock 132 to the 1/0 port 140 of the cryptography electronics 112. The cryptography electronics 112 include a controller 134, memory 136 and software 138 necessary to encrypt and decrypt data, as well as provide any additional operations. The memory 126, 136 may include random access memory (RAM), read only memory (ROM), or a combination thereof, Notably, the communication controller 124 and the cryptography controller 134 may be integrated into one controller. Similarly, the software and memory of the communication and cryptography modules may be integrated or embodied in hardware.

As shown in Figure 413, the communication and cryptography electronics, as well as any associated controllers, may be integrated into a single controller system and/or integrated circuit.

In such cases, a single controller 142 is associated with memory 144 having software 146 as necessary for operation. In such an integrated system, the controller 142 will carry out any cryptography functions as well as any other functions necessary for operation.

In the preferred embodiment, the communications controller 124, 142 specifically provides a spread-spectrum processor associated with an 8-bit microcontroller. The memory 126, 144 includes 256 bytes of RAM. The receiver I 1 6 operates in conjunction with the spread-spectrum processor and is capable of receiving direct sequence, spread-spectrum signals having a center frequency of 2.44175 GHz. The transmitter 114 is preferably a DPSK modulated back-scatter transmitter transmitting differential phase shift key (DPSK) modulated back scatter at 2.44175 GHz with a 596 KHz sub-carrier. The various interrogators in the fueling environment I 0 are adapted to receive and transmit the signals to properly communicate with the transponders. For additional information on a transponder/interrogator system- providing for highly secure transactions between a transponder and a host authorization system through a dispenser, attention is drawn to US application Serial No. 08/895,417 filed July 16, 1997, entitled CRYPTOGRAPHY SECURITY FOR REMOTE DISPENSER TRANSACTIONS in the name of William S. Johnson, Jr.; US application Serial No. 08/895,282 filed July 16, 1997, entitled MEMORY AND PASSWORD ORGANIZATION FOR REMOTE DISPENSER TRANSACTIONS in the name of William S. Johnson, Jr.; and US application Serial No.

08/895,225 filed July 16, 1997, entitled PROTOCOL FOR REMOTE DISPENSER TRANSACTIONS in the name of William S. Johnson, Jr. The disclosures of these applications are incorporated herein by reference.

Figure 5 shows a basic schematic overview of the dispenser electronics wherein a dispenser control system 80 includes a controller associated with the memory 82 to interface with the central control system 50 through an interface 146. The dispenser control system 80 provides a graphical user interface with key pad 102 and display 100. Audio/video electronics 86 is adapted to interface with the dispenser control system 80 and/or an auxiliary audio/video source 156 to provide advertising, merchandising and multimedia presentations to a customer in addition to basic transaction functions. The graphical user interface provided by the dispenser allows customers to purchase goods and services other than fuel at the dispenser. The customer may purchase a car wash and/or order food from the QSR while fueling the vehicle. Preferably, the customer is provided a video menu at the display 100 to facilitate selection of the various services, goods and food available for purchase. The card reader 88 and cash acceptor 90 allow the customer to pay for any of the services, goods or food ordered at the dispenser while the printer 92 will provide a written record of the transaction. The dispenser control system 80 is operatively associated with a dispenser interrogator 52, which has a receiver 142 and a transmitter 144. The receiver and transmitter typically associate with one or more antennas 108 to provide remote communications with a transponder. The dispenser control system 80 communicates with the central control system 50 in the backroom 26.

In like fashion, the convenience store transaction electronics shown in Figure 6, and more specifically the transaction terminal register 30, include a store transaction controller 152, associated memory 154, the interrogator 54. and a display and key pad 150, 160 forming a transaction terminal interface. The transaction controller 152 interacts with the central control system 50 through the central site control interface 160. The interrogator 54 includes a receiver 162 and a transmitter 164, both of which are associated with one or more antennas 166. The transaction terminal 30 is adapted to provide typical transaction functions of a cash register and a card authorization terminal in addition to communicating with transponders within the store and/or proximate to the tenninal. The

communications between the transponder and the store transaction terminal are generally related to transactional and customer identification and monitoring, although other features will become apparent to those skilled in the art upon reading this disclosure.

Attention is now drawn to Figure 7 and the schematic outline of the QSR electronics shown therein. The QSR will generally have a controller 168 and associated memory 170 capable of interfacing with the central control system 50 through a central site control interface 172. As with many QSR's, a transaction terminal or re ister 174 is provided having a key pad 176 and
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display 178. The QSR transaction terminal 174 is used by a QSR operator to take customer orders from within the store in conventional fashion. The orders are either verbally or electronically communicated to the food preparation area 40 through the QSR controller 168.

The QSR transaction terminal 174 is associated with interrogator 56 having a receiver 177 and a transmitter 179 associated with one or more antennas 175. The food preparation area will typically have a food preparation interface 42 having a display 180 and a key pad 182. The food preparation interface 42 may be a terminal run from the QSR controller 168 or may contain a food preparation controller 184 within the food preparation interface 42. However the system is arranged, order infonnation is passed from one of the order interfaces to the food preparation display 180 to alert food preparers of an order.

In a QSR embodiment providing drive-thru capability, a remote order entry interface 186 is provided. The order entry interface 186 may include a simple menu board and audio intercom system 188, or in a more sophisticated embodiment, may provide for bi-directional video intercom using the audio intercom 188 and a video system 190 allowing the customer and QSR operator to audibly and visually interact with one another during order placement. The order entry interface 186 may also include an interrogator 60 having a receiver 192 and a transmitter 194, associated with one or more antennas 195, for communicating with a transponder of a customer when the customer is placing an order at the order entry interface 186.

Typically, orders placed at the order entry interface 186 are sent to the order pick-up interface 196, which is normally situated proximate to the pick-up window 36 at the end of the drive-thru lane. The order pick-up interface 196 will have an audio system 198 to provide the audio intercom and an optional video system 200 if video intercom with the order entry interface 186 is desired. The order pick-up interface 196 also has an associated interrogator 58 having a receiver 202 and a transmitter 204 associated with one or more antennas 206.

Unlike existing QSR's, the present invention may include a customer position detector 208, preferably placed somewhere along the drive-thru lane to detect when a customer is at or is past that position en route to pick up an order, which may have been placed at a fuel dispenser 18.

The customer position detector 208 is associated with the drive-thru position interrogator 62 and includes a receiver 21 0 and a transmitter 212 associated with one or more antennas 214.

Figure 8 depicts the basic outline of the car wash electronics, which includes a controller 216, memory 218, a key pad 220, a display 222 and the interrogator 51. The key pad 220 and display 222 combine with the

controller 216 to provide a customer interface 48. The interrogator 51 includes a receiver 224 and a transmitter 226 associated with one or more antennas 228. Additionally, the car wash controller 216 preferably communicates with the central control system 50 in the store via a central site control interface 230. The interrogator 51 will typically communicate with a customer transponder to automatically authorize a car wash previously paid for at the dispenser or inside the store. The key pad may be used to insert a secret code or other information to select a type of wash or otherwise authorize the car wash.

Figure 9 generally depicts the central control system 50 found in the backroorn 26 of the fueling environment 10. The central control system 50 may include one or more controllers 232 associated with memory 234. The central control system 50 may include multiple interfaces with the various areas in the fueling environment 10. These interfaces include the car wash interface 2310, dispenser interface 146, QSR interface 172 and the vending interface 236 connected to an automated vending machine 28. Additionally, the central controller 232 may have a dedicated network or authorization interface 23 8 connected to a host transaction network 94 for authorizing credit and debit transactions and the like. An Internet interface may also be provided for transactions and other information relating to operation, advertising, merchandising and general inventory and management functions.

The dedicated authorization interface and/or Internet interface may operate on a dedicated service line or a telephone system 242. Furthermore, the central control system 50 may have a direct operator interface 244 associated with the controller 232 to allow an operator to interact with the control system. In more advanced embodiments, a central positioning interface 246 associated with multiple antennas 248 may be used to determine transponder position and location throughout the fueling environment. Those skilled in the art will be aware of a multitude of positioning and locating techniques, such as triangulation, wherein various characteristics of a signal emitted from the transponder are measured and monitored to determine **movement** as well as precise location. The antennas 248 associated with the central positioning interface 246 may take the place of or act in conjunction with the various antennas throughout the fueling environment to locate and monitor **movement** of the transponders in the fueling environment. Attention is drawn to US application Serial No. 08/966,237 entitled TRANSPONDER DISTINCTION IN A FUELING ENVIRONMENT filed November 7,1997, in the name of William S. Johnson, Jr. and US application Serial No. 08/759,733 filed December 6, 1996, entitled INTELLIGENT FUELING in the name of Hartsell, et al. The entire disclosure of these two patent applications is incorporated herein by reference.

Multistage Ordering

One of the many unique aspects of the present invention is providing for **monitoring** **customer** position throughout the fueling environment in order to associate orders placed at the fuel dispenser with the particular **customer** that placed the order at the appropriate receiving point, such as the QSR drive-thru terminal and window 36, QSR transaction terminal 34 in the **store** , or, in the case of a car wash, at the car wash interface 48. In addition to associating the **customer** picking up the order with the appropriate order, the QSR can monitor or detect the position of the **customer** in the drive-thru line or elsewhere in the fueling environment to determine when to start order preparation. For example, during the fueling operation, the **customer** may decide to order a few items from the QSR menu displayed at the dispenser 18. As the customer enters the order, the order is associated with the transponder

carried by the customer or mounted on the customer's vehicle.

The customer may choose to pay for the order along with the fuel at the dispenser, at the order pick-up place at the drive-thru window, or at one of the in-store registers associated with the QSR or the convenience store. Continuing with our example and assurning the transaction was paid for at the dispenser along with the fuel, the customer will enter his vehicle and proceed to drive around the fuel station store along the drive-thru lane and pass the customer position monitor 46. As the customer approaches the customer position monitor 46, the drive-thru position interrogator 62 will receive a signal from the customer transponder indicating the customer is at a known position in the drive-thru lane. At this point, the QSR control system 168 will alert the food preparation area 40 to prepare the order and indicate to the order pick-up interface and controller 196 the position of the customer in tile drive-thru lane. Once the customer reaches the order pick-up window, the order pick-up interrogator Nvill determine the presence of the customer transponder and associate the customer's order accordingly so that the drive-thru window operator can deliver the freshly prepared order to the correct customer.

Associating the customer with the appropriate order in a fueling environment having a QSR is quite different from traditional QSR drive-thru systems. With QSTs in a fueling environment, orders for pick up at the drive-thru window, or within the store for that matter, may be placed in a different sequence than the sequence in which the orders are actually picked up. The reason for the possible discrepancy between order placement and order pick up arises because orders can be placed at several locations, including the fuel dispenser and the traditional order entry interface 44. In particular, those customers placing orders at the dispenser will most likely intermingle in the drive-thru line with those placing orders at the order entry interface 44. The present invention uses transponders to appropriately associate orders placed at different locations with the appropriate customer at a common pick-up location.

With this in mind, attention is drawn to the flow chart of Figures I OA and I OB representing the basic flow of various multistage ordering processes. The process begins (block 500) when the dispenser interrogator 52 receives a signal from a transponder 12, 14 and the dispenser control system 80 forwards transponder identification indicia (ID) to the central control system 50 for authorization (block 502). Authorization may occur locally at the central site controller 232 or at a remote host authorization network. The information to be authorized is generally financial or account information and can either be transmitted with the transponder ID or stored at the central control svstem 50 or the host network 94 in association with the transponder ID. In the latter case, either the host network 94 or the central control system 50 will associate the ID with the stored account information and then authorize the transponder based on the correlated account inforniation. Preferablv, the transponder is read and authorized as the customer and/or vehicle approaches or initially stops at the fueling position and preferably, at least, before a transaction is initiated to increase transaction efficiency. As the customer fuels the vehicle, the dispenser may display various types of infon-nation including advertising and instructional information. Preferably, the dispenser 18 will display options for ordering food items from the QSR or ordering a car wash at the car wash 24 (block 504). The dispenser 18 will determine whether an order is placed (block 506). The dispenser 18 will receive any orders placed by the customer (block 508) and associate the order with the transponder in some fashion (block 5 1 0).

Typically, the order is associated with a transponder by (1) associating the order with the transponder ID at one of the control systems, (2) transmitting and storing a code associated with the order on the transponder, or (3) actually storing the order on the transponder. Those of ordinary skill in the art will recognize that there are many variations available for associating an order with a transponder. These variations are considered within the scope of this disclosure and the claims that follow.

Although there are various options, two general methods for associating an order with a transponder will be discussed below. With the first, no information is transmitted to the transponder relating to the order. Instead, the electronics at the dispenser 18, central control system 50 or the QSR 22 stores the order information and associates the order with the transponder ID. When one of the interrogators subsequently reads the transponder ID, the pertinent system will correlate the order with the transponder ID. The second method involves writing infon-nation to the transponder at the dispenser I 8 and subsequently transmitting that infonnation. to one of the system interrogators for authorization or order identification. The information written to the transponder may range from a code for identification authorization purposes to the complete order placed at the dispenser.

Returning to Figure I OA, the basic flow of both of the above-discussed methods are shown. In cases where one of the control systems associates an order based on the transponder ID, the customer order is transferred to the QSR controller 108 through the central control system 50 (block 512). The dispenser 18 will effect payment for the transaction (typically adding the QSR purchase total to the fueling charge) and the QSR controller 168 will alert the food preparation area to prepare the order (block 514).

In a basic environment, the QSR order pick-up interface 198 will monitor for the presence of a transponder through the drive-thru pick-up interrogator 58 or the in-store QSR transaction terminal interrogator 56 (block 516). If a transponder is not detected, the systems continue to monitor for a transponder (block 518). Once a transponder is detected, the transponder ID is received (block 520) and the transponder ID is associated with the appropriate order (block 522). At this point, the QSR operator located at the pick-up window or the in-store transaction terminal is informed of the order corresponding to the customer at the window or terminal (block 524) and the fueling and retail transaction for that particular customer ends (block 526).

Alternatively, once a customer places an order and the dispenser 18 receives the order (block 508), and the order is associated with the transponder (block 510), the dispenser 18 may transmit order indicia, such as a code for the order itself, to the transponder for storage (block 528). Next, the dispenser 18 will effect payment for the transaction as discussed above (block 530). In the more basic embodiment discussed above, the QSR interrogators associated with the QSR window or in-store terminal will monitor for the presence of a transponder (block 516 and 518), receive the transponder order indicia (block 518), and associate the order with the indicia received from the transponder (block 522). The operator is then informed of the order for that particular customer (block 524).

In any of the above embodiments, the customer position detector 46 may be used to alert QSR operators of the approach and location in the

drive-thru line of a particular customer. For the sake of clarity, the process of Figure I OA only depicts using the customer position detector 46 in a process where order indicia is transmitted to the transponder. Please note that using the customer position detector 46 may be used in any of the embodiments, as those of ordinary skill in the art will appreciate.

Once the order is placed, received and associated with the transponder in normal fashion (blocks 500-5 1 0), indicia of the order is transmitted to the transponder (block 528) and the transaction is effected (block 530) in normal fashion. At this point, the customer position detector 46 will monitor for the presence of a transponder via the interrogator 62 (blocks 532 and 534). Once a transponder is detected, the customer position detector 46 will forward the transponder indicia to the food preparation area 40 through the QSR controller 108. This allows for the food preparation operators to timely prepare a customer order based on the customer's approach to the pick-up window (block 536). This information may also be sent to the pick-up operator to indicate customer position. The customer will proceed along the drive-thru lane until the pick-up window is approached where the transponder is detected by the order pick-up interrogator 58 (blocks 516 and 518). The transponder ID or indicia is received by the QSR electronics, and the operator is infon-ned of the order corresponding to the customer at the window (blocks 522-526).

Although there are numerous variations to multistage ordering, the important aspects of the invention are associating a transponder with an order placed by a customer at the fuel dispenser and subsequently using information from the transponder to reassociate the order with that particular transponder. Optionally, an additional interrogation stage may provide a further alert to a QSR operator of the approach of a customer to initiate food preparation or simply indicate the position of the customer in line.

The multistage ordering works equally well with QSR's and car wash systems. When a car wash is ordered at the dispenser, the particular car wash ordered is associated with the transponder at the dispenser and subsequently reassociated when the customer approaches the car wash area 24 and is interrogated by the car wash interrogator 51. In the preferred embodiment, the dispenser operates in conjunction with the central control system 50 to provide authorization of the car wash purchased at the dispenser. When the customer is at the car wash 24, the customer's transponder is interrogated for an ID or a code, which the car wash controller and/or the central control system 50 recognizes as preauthorized. If additional security is necessary on any of these embodiments, the customer may receive a code or other indicia, which they are required to enter or submit when the corresponding goods or services are received.

Furthermore, the fuel dispenser 18 is not the only point of sale where ordering may take place.

A customer having a transponder may, for instance, order a car wash in conjunction with placing an order at the in-store QSR terminal or the convenience store terminal while purchasing food or other merchandise. The interrogators at either of these tenninals can just as easily associate the car wash with the customer transponder and operate through the central control system 50 to subsequently reassociate the customer and the car wash ordered at the car wash interface 48. The multistage ordering disclosed herein provides a solution for keeping **track** of

various transactions in a fueling environment where customer orders are picked up in locations separate from where they are placed and very likely may not be picked up in the order they were placed.

Loyalty Benefits
The present invention may also be configured to provide various types of loyalty benefits based on past and/or current transactions. Loyalty benefits will be provided to a customer in order to encourage subsequent return to a particular fueling environment or one of an associated group of environments. The benefit may also encourage the purchase of additional products during the current or a subsequent transaction. The benefits may include cash rebates or discounts providing a type of electronic couponing to enhance merchandising and marketing efforts. A loyalty point may be earned by a customer for each transaction, transaction amount, or type or quantity of a particular product or service, For example, a loyalty point may be earned for each gallon of gas purchased or for a fill-up requiring eight or more gallons of gas. The store operators have tremendous flexibility in determining the various criteria for earning loyalty points. Additionally, the loyalty benefits or points are preferably redeemed by a customer in part, or in whole, on subsequent visits to the same or an associated fueling envirom-nent.

Redeeming points at a subsequent transaction provides an incentive for a customer to return to environments participating in the benefit program. Although redeeming points on a subsequent purchase is preferred, benefits may be made immediately available based solely on the current transaction. Furthen-nore, the benefits may be based upon current and prior transactions, and allow for both current and subsequent benefit. The basic flow of the process for providing such benefits is shown in Figure I OC.

The process begins (block 540) when a transponder is interrogated (block 542). Preferably, indicia, including identification indicia, is received from the transponder (block 544). Once the relevant controller receives the transponder indicia, one of two events typically occurs. The first option is to receive loyalty information,which is included in the transponder indicia, directly from the transponder. Optionally, the controller may use the transponder indicia, preferably identification indicia, to look up benefit infort-nation, including loyalty points, stored in an associated database anywhere within the fueling environtrient or at a remote network (block 546). Thus, loyalty information may be stored on the transponder and transmitted to the relevant control system or accessed from virtually any location based on some type of identification provided by the transponder.

At this point, the customer is engaging in a transaction and the relevant control systems will monitor such transaction (block 548) and determine whether to provide a benefit based on the current transaction (block 550). If a benefit is to be provided based on the current transaction, the controller will deten-nine how to apply the current benefit information (block 552). The controller basically has two options. The controller may store the benefit information on the transponder or the relevant database (block 554), or apply the current benefit information to the current transaction (block 556).

Regardless of whether a benefit is provided based on the current transaction, the controller will preferably determine whether or not to apply a stored benefit to the current transaction based
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on prior transactions (block 558). If a stored benefit is not available or the controller is not adapted to provide such benefit, the process ends (block 560). If a stored benefit is available for application to the current transaction, the transaction is updated and the appropriate database in the transponder or associated with the controller is updated (block 562). Typically, the benefit is applied to the current transaction at this time, and the process is ended (block 560).

The loyalty benefits capable of being provided by this process allow tremendous flexibility and automatically implement incentives to increase customer loyalty and improve business.

Cash Customers

Another important aspect of the present invention is providing refunds and loyalty points or benefits to cash customers. Traditionally, service stations were not able to monitor cash transactions or cash customers for merchandising efforts or to provide these customers with benefits that were provided to card customers. The card customers provided the service station operators with information to determine what types of purchasing activities specific customers had in addition to providing the customer with various benefits based on prior purchases and transactions. For example, a system comparable to the central control system 50, alone or in conjunction with a remote host network 94, could **track** customer purchases and provide a benefit based on a purchase type or an amount of a series of purchases. Prior to applicant's invention, cash customers were basically "invisible" to these types of merchandising aspects of the fuel station environment.

Additionallv, efforts have been made to provide cash acceptors at the fuel dispensers 18 to enable customers to pay cash at the dispenser in order to expedite the fueling transaction for the benefit of the station operator and customer. The difficulty in using cash acceptors is providing the customer proper change when the amount of fuel dispensed differs from the cash amount inserted into the cash acceptor 90. Although the fuel dispenser 18 is a sophisticated instrument, it is not economical to further include a change machine at each fueling position of each dispenser. Thus, cash acceptor technology has not caught on in most fueling environments.

Furthermore, requiring a customer to enter the store to receive his or her cash refund or change defeats the purpose of paying at the dispenser. Similarly, since the customer's vehicle tank ullage is unknown, fueling to a prepaid dollar amount is often impractical and inconvenient to the customer.

The present invention provides a solution to the above problems by keeping **track** of cash customers and their respective refunds and loyalty points using transponder technology. A cash customer either carries a transponder or has a transponder mounted on his or her vehicle, and the transponder is used to associate any refunds or loyalty benefits with the otherwise invisible cash customer. The customer may use the cash acceptor 90 of the fuel dispenser 18 and receive any change as credit on or associated with the transponder. The transponder may simply provide an ID and the central control system 50 or remote host network 94 will keep **track** of the refund associated with that ID for later credit. Alternatively, the refund amount or credit may be directly transmitted to and stored on the transponder wherein that amount is transmitted to a dispenser for credit on a subsequent fueling transaction or to a cash dispensing machine at the site.

With this invention, customer loyalty and merchandising programs are made available using a transponder associatedwith a cash customer. Whether the customer pays at the dispenser or at one of the registers inside the store, interrogators placed at the dispensers, registers or anywhere else in the store can interact with the customer transponder in order to keep **track** of loyalty points, benefit information or simply monitor the customer's purchasing habits. This infon-nation is preferably stored at the central control system 50, at a remote host network 94 or directly on the transponder.

Attention is drawn to Figures I IA and I I B depicting a flow chart representing basic interaction with the transponder of the cash customer. Typically, a new transaction begins when a cash customer having a personal transponder 12 or vehicle mounted transponder 14 drives up to a fueling position at one of the dispensers 18 and begins fueling (block 600). The customer will generally start a new transaction by beginning fueling (block 602). This is typically accomplished by initially interacting with the fuel dispenser user interface comprising the key pad and display 102, 100 to select a cash or credit transaction. The dispenser control system 80 will determine if the customer is making a cash transaction (block 604) and relay that information to the central control system 50. Although determining whether or not the customer is conducting a cash transaction occurs at the beginning of the fueling process in Figures 1 IA and 1 IB, this determination can be made anytime during the fueling operation and at virtually any payment location, including the register or transaction terminal 30 in the store.
At this point, the dispenser control system 80, operating in conjunction with the dispenser interrogator 52, will retrieve the transponder ID (block 606). The dispenser control system 80 and central control system 50 will operate to retrieve information relating to prior transactions which mav affect the current transaction. This information may be cash refunds from previous transactions, credits or loyalty points, or other benefits based on prior transactions. These benefits may include electronic couponing, wherein discounts for future purchases may be provided for any variety of merchandising or marketing reasons. Depending on system configuration, this information may be stored on the transponder, or at any of the control systems in the fueling environment, such as the central control system, in addition to being maintained at a remote host network 94 system communicating with other stations. When the information is stored on the transponder or at the remote network, loyalty programs and refund data is made easily attainable by other fueling environment systems. Thus, the dispenser 18 may retrieve prior transaction information from the transponder (block 608) or retrieve this information fi-om. a database stored at one of many control systems associated with the dispenser (block 6 1 0). Regardless of system architecture, some type of identification indicia is necessary to associate a particular customer's information with a corresponding transponder.
Subsequently, one of the controllers associated with the dispenser such as the dispenser control system 80, convenience store transaction controller 152 or central site controller 232, will determine a transaction subtotal (block 612). The controller will apply any prior refunds, loyalty points or benefits the customer has accumulated due to the current transaction and/or any prior transactions (block 614). A new transaction total is then detennined (block 616).

Next, payment is received at one of the in-store registers, such as the in-store transaction terminal 30, or at the cash acceptor 90 of the dispenser 18 (block 618). Notably, initial dispenser authorization may depend upon receiving the cash payment at the beginning of the fueling

operation and before fueling begins. The dispenser control system 80, or one of the associated controllers. will subsequently determine a refund amount and any loyalty points or benefits accumulated based on the current transaction and anv earlier transactions, accordingly.

The station operator has tremendous freedom in determining the criteria for issuing benefits and points based on a single transaction or a series of transactions. Depending on whether the information is stored directly on a transponder or elsewhere, the refund and loyalty infonnation must be transmitted to the transponder through the appropriate interrogator, such as the dispenser interrogator 52 or the store transaction interrogator 54. The appropriate interrogator primarily depends on where the actual cash transaction takes place. If the information is not stored on the transponder, the information will be stored at one of the local control systems or the host network 94 (block 624). Once the transaction is over, the system will begin anew by waiting for another transponder-carrying cash customer (block 626).

Discount For Transponder Use

Another aspect of the invention is providing a system capable of applying a discount to a transaction when a transponder or other preferred method of payment is used. The system is preferably adapted to provide benefits or discounts to a transaction when a transponder is associated with the transaction to encourage transponder use, while avoiding cash payment or other less desirable payment methods.

Attention is now directed to Figure 1 IC where a basic process for discounting a transponder related transaction is shown. As the process begins (block 630), a transponder is interrogated (block 632) and transponder indicia is received by one of the control systems in the fueling environment (block 634). The control system will proceed with the transaction (block 636) and will ultimately deten-nine what type of method will be used for the transaction and what., if any, discount will be provided based on the chosen method of payment.

Initially, the control system will determine whether or not a transponder is being used in association with the transaction (block 638). If a transponder is being used, the control system will provide a first discount rate to all or a portion of the transaction (block 640), and proceed to determine transaction totals (block 650). If a transponder is not used in association with the transaction, the control system may determine whether or not a card, such as debit, credit or smartcard, is used with the transaction (block 642). If a card is used in association with the transaction, the control system may provide a second discount for all or a portion of the transaction (block 644), and proceed to determine transaction totals (block 650).

If there is no transponder or card associated with the transaction, the control system may determine whether or not the transaction is a cash transaction (block 646). This may be by default if no card or transponder is used, or may result from the customer selecting a cash transaction or an operator indicating a cash transaction at a POS position. If a cash transaction is determined, the control system is configured to provide a third discount rate to all or part of the transaction (block 648) and proceed to determine transaction totals (block 650).

The system operator may elect to provide different rates for the first@ second and third discount rates associated with the transponder, card and cash transactions, respectively. Furthermore, the operator may elect not to provide a discount for all or any combination of the various methods

of payment. Preferably, a greater discount is provided for transactions using a transponder in order to encourage transponder use with transactions. Similarly, to avoid the use of cash transactions, the system operator may decide not to provide any discount for cash transactions. Once the transaction totals are deten-nined (block 650) and the appropriate discount rates are applied, payment is received (block 652) and the process comes to an end (block 654). Those skilled in the art should quickly recognize the benefits inherent in certain payment methods to improve transaction efficiencies and encourage methods of payment beneficial to the station operator.

Cash Prepay With Transponder

Another aspect of the present invention is to provide a system and method for providing a prepaid transponder capable of being used with dispensers and other POS terminals in a fueling environment. The present invention allows a customer to prepay for subsequent transactions at a terminal capable of communicating with the transponder in order to store the amount of prepayment on the transponder, or at least associate the amount of prepayment in a database associated with the terminal and any future transaction locations, such as a fuel dispenser.

Attention is directed to Figures I 1D and 1 IE where a basic process for using a prepaid transponder is shown. When the basic process begins (block 660), a transponder is interrogated at a cash or other payment receiving terminal (block 662). The terminal will receive cash or other value (block 664), and either transmit to the transponder a value for the cash or other prepayment received or store that value in a database associated with the controller (block 666).

At this point, the transponder has value (or is associated with value) and is capable of being interrogated at various POS ten-ninals. In this example, the POS is an interface at a fuel dispenser. During the transaction, the dispenser will interrogate the transponder (block 668) and authorize a transaction within the stored credit or value of the transponder (block 670). The transaction will proceed (block 672) and the appropriate control system will determine that the values incurred during a transaction remain less than the value of the transponder (block 674). As the transaction is monitored, the control system will stop or limit the transaction (block 684) before the value of the transponder is exceeded. As long as the transaction remains less than the value of the transponder, the transaction will proceed until completed (block 676). Once the transaction is complete, the control system will determine transaction totals (block 678) and transmit such totals to the transponder for accounting (block 680). Alternatively, these totals may be sent to a database corresponding to the respective transponder in order to keep **track** of prepayment and associated totals. The accounting may be done at the transponder, wherein the value of the transaction is received by the transponder and the appropriate calculations are completed. Alternatively, the control system may simply update the value associated with the transponder by either transmitting this value directly to the transponder or storing it in the databases associated with the transponder.

Preferably, the control system will interact with the transponder or the database maintaining the value associated with the transponder to detennine the remaining transponder totals or value (block 682), and display such totals to the customer (block 686). These totals may include the amount of prior transactions, the remaining value of the transponder before the transaction, or the value of the transponder after the transaction. The system operator will have great flexibility in deciding

the various accounting information made available to the customer. Preferably, the information will be sufficient to allow the customer to recognize when the transponder value is approaching zero (0) or a predefined threshold to alert the customer that it is time to add value to the transponder.

For example, the control system may monitor the transponder value to determine whether that value is less than or equal to a predefined value, such as zero, or any other desired threshold.

If the value is less than or equal to the set value, the control system may be configured to alert the customer of the current transponder value and that it has dropped below the threshold amount (block 690) and the process ends (block 692). If the transponder value is greater than the threshold, the system operator may elect not to provide a warning to the customer and end the process (block 692).

Notably, during any portion of the process described above, the control system may allow the customer to add value to the transponder at the current transaction terminal. For instance, the customer may use the cash acceptor or card reader at the fuel dispenser to add value to the transponder. The customer will simply determine an amount to add to the transponder, and the dispenser interrogator will simply interrogate the transponder and transmit the relevant added value infori-nation to the transponder or receive the transponder ID and update an associated database accordingly (blocks 662 - 666). Storing this value should be interpreted to include adding to or subtracting from an existing value or any other accounting necessary for operation.

Transponder Monitoring and Location Detection
In several aspects of the present invention, it is desirable to determine the location and/or proximity of a transponder, whether vehicle mounted or carried by a customer, with respect to a specific fueling position of a dispenser or interrogation system. In other aspects, it is desirable to **track** the transponder throughout the fueling environment 10. Although the embodiments described herein use the dispenser as a reference, any of the interrogation systems in the fueling environment may be adapted to determine transponder location and/or proximity.

Determining location and proximity of a transponder with respect to a fuel dispenser in a fueling environment presents a unique problem because the fueling environment includes multiple dispensers with multiple positions. At any given time, numerous transponders will be in or moving about the fueling environment and the many interrogation fields associated with the various interrogators. The dispensers and associated control systems must distinguish between personal and vehicle-mounted transponders used to carry out a transaction from transponders attached to a vehicle driving by the fueling position or carried by a person walking by the dispenser. Fueling environments must be able to avoid communicating with a second transponder during a transaction with a first transponder.

Texas Instrurnents (TI) has made an attempt at implementing a system in a fueling environment capable of communicating with transponders. The beta sites for the Texas Instr-aments system are believed to communicate with transponders using an interrogator transmitting an interrogation signal having a 134 kHz carrier. Certain transponders within range of the 134 kHz signal will transmit a signal back to the interrogator using either a 134 kHz or a 903 MHz carrier.

The TI system uses two different types of RFID devices: handheld and car mount transponders.

The handheld transponder transmits and receives radio communications at 134 kHz. The car mount transponder receives at 134 kHz and transmits at 903 MHz. The dispenser is equipped with a large loop antenna adapted to transmit at 134 kHz and a smaller antenna configured to receive at 903 MHz. The smaller 903 MHz antenna is mounted with the large loop antenna at the top of the dispenser. The TI system also requires an antenna mounted on the dispenser face and adapted to transmit and receive at 134 kHz. The car mount transponder communicates to the fuel dispenser via the large loop antenna located at the top of the dispenser.

A handheld transponder outside of the face mounted antenna@s range may receive a signal transmitted from the loop antenna, but the dispenser will not be affected because the handheld transponder responds to the loop antenna polling by transmitting back at 134 kHz, a frequency ignored by the 903 NHU receiving antenna. The only way that the 134 kHz signal from the handheld transponder can be picked up by the dispenser is by putting the transponder within 2-6 inches of the fuel dispenser door, where the face antenna is located. The face antenna, which is typically mounted in the dispenser door for handheld transponders, cannot receive other signals due to its limited power and range.

The 134 kHz loop antenna sends the car mount transponder its interrogation ID number and the car mount transponder responds with the same ID number so that its signal will be ignored by other dispenser loop antennas that accidentally pick up signals having different interrogation ID numbers. The loop antenna is not a directional antenna, but its range can be limited to a defined area with reasonable certainty so that its 134 kHz interrogation signal is not picked up by another car at another dispenser. The loop antenna can be adjusted so that overlap with other loop antennas in the forecourt is minimal or non-existent.

The 903 N4Hz signal sent by the car mounted transponder is omni directional meaning its signal can travel in all directions and can be picked up easily by other dispensers. The reason that this is not problematic is that the 903 N4Ez signal sent by the car mount transponder containing the
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interrogation ID number of the dispenser it wishes to communicate with will only be sent after being contacted by the signal having its interrogation ID number. This way, other dispensers with different interrogation ID numbers will ignore a signal sent by a car mount transponder with a different interrogation ID number.

The 903 N4Hz signal transmitted from the transponder to the interrogator is substantially non-directional and can be heard throughout the entire fueling environment and most likely for quite some distance outside the fueling environment. Transponder transmissions carrying throughout the fueling environment add significant difficulty in correlating a transponder with the proper dispenser and respective fueling position. In addition to the inherent difficulties in locating and distinguishing between transponders within the fueling environment, the Texas Instruments system requires different types of antennas, modulation schemes and communication electronics for transmitting and receiving signals to and from the transponders.

Applicants' invention provides a solution to the difficulties of locating and communicating with transponders within the fueling environment by (1)

providing a communications system operating at frequency ranges which are very directional, (2) controlling the power at which the communications system operates and (3) simplifying the communications electronics by operating at the same carrier frequency when communicating with any transponder.

Communicating at substantially the same carrier frequency allows interrogators to use the same or similar antennas to transmit and receive. Furthermore, these more directional frequencies require smaller antennas, which are easily integrated into the fueling environment or dispenser in an economical and aesthetically acceptable manner.
The preferred arrangement of applicants' antennas is shown in Figures 12A and 12B. In Figure 12A, a side view of a fuel dispenser I 8 under a canopy or awning 249 is shown with multiple configurations of antennas adapted to communicate with various transponders proximate to either of the fueling positions A or B. The antennas are adapted to transmit, receive or transmit and receive at substantially directional frequencies, including those in the microwave range, and preferably around about 2.45 GHz. In these embodiments, there are basically three suggested antenna locations wherein various combinations of antennas at these locations are used. Please note that the antennas of Figures 12A and 12B are not referenced as 108, for the sake of clarity in describing antenna placement.

The first antenna location is near the middle of a front face of the dispenser 18. A mid-dispenser transmit antenna 251 and mid-dispenser receive antenna 253 are placed near this midpoint. The antennas may be located in the central portion of the dispenser or located anywhere along the front face of the dispenser, including near the respective sides of the dispenser as shown in Figure 12B. The mid-dispenser antennas 251, 253 preferably provide a limited power and limited range field pattern to communicate with a transponder 66 carried by a customer. The field provided by the mid-dispenser transmit antenna 251 is preferably large enough to properly communicate with the customer-carried transponder 66 in the fueling position and in front of the dispenser without requiring the customer to remove the transponder from a purse, wallet or pocket and wave the transponder next to the dispenser 18 or a receiving antenna.

Additionally, a top-mount transmit antenna 255 and top-mount receive antenna 257 may be provided at or near the top of the dispenser 18 and adapted to provide a focused, directional and preferably conically shaped field downward over the respective fueling position. These top-mount antennas 255, 257 are preferably located on each side of the dispenser 18 as shown in Figure 12B in similar fashion to the preferred placement of the mid-dispenser antennas 25 1, 253. The duplication and spacing of these antennas help avoid interference caused by people or other objects breaking the communication path between the respective antenna and transponder. This allows the transponder to communicate with the dispenser through one antenna or set of antennas, even if something blocks the field from the other set of antennas.

Another option is to place the antenna substantially directly over the fueling position A or B.

In such an embodiment, overhead receive antenna 259 and overhead transmit antenna 261 are mounted over the fueling position A, B using an overhead antenna mount 263. The overhead antennas 261, 263 operate in the same manner as the top-mount antennas 255, 257, and may also be spaced apart to provide varying positions to create an interrogation field. Notably, the antennas for receiving and transmitting may be combined into one

wherein a suitable circulator or like electronics 241 is incorporated into the interrogator or communications electronics to provide for reception and transmission from a single antenna. With any of these embodiments, the antennas may cooperate directly with the central control system 50 or with the dispenser control system 80 to allow overall system monitoring of transponders at the various positions.

In these situations, the selected control system will alert the dispenser of transponder presence.

As noted, various combinations of these antennas can be used. For example, the preferred embodiment includes two mid-dispenser transmit antennas 25 1, two top-mount transmit antennas 255, and two top-mount receive antennas 257. The top-mount receive antennas 257 are adapted to receive signals transmitted frorn the transponder in response to signals from either the mid-dispenser transmit antennas 251 or the top-mount transmit antennas 255. In operation, when a customer-carried transponder 66 enters the field provided by the mid-dispenser transmit antenna 25 1, the transmitter reflects a signal which is received by the top-mount receive antenna 257. Alternatively, vehicle-mounted transponders 64 may enter the interrogation field provided by the top-mount transmit antenna 255 and respond with a signal received by the top-mount receive antenna 257.

The interrogation fields provided by any of the transmit antennas 251, 255, 259 may be adjusted to control the size and shape of the respective fields. For example, the system may be configured to more easily distinguish between transponders carried by a person and vehicle-mounted transponders by configuring the respective interrogation fields provided by the mid-dispenser transmit antenna 251 and the top-mount transmit antenna 255 or overhead transmit antenna 259, such that the respective interrogation fields do not overlap or overlap in a desired and select pattern. Thus, communications resulting from an interrogation with the mid-dispenser transmit antenna 251 indicate a transponder carried by the customer while communications resulting from the top-mount or overhead transmit antenna 255, 259 may be indicative of vehicle-mounted transponders.

Attention is now drawn to Figures 12C and 12D, which depict a flow chart of a basic process for monitoring the location and position of a particular type of transponder using top-mount transmit antennas 255 or overhead transmit antennas 259 and a mid-dispenser transmit antenna 251 in conjunction with one or more top-mount or overhead-mount receive antennas 257, 26 1.

In this preferred embodiment, one or more of the transmit antennas mounted substantially above the customer will alternate sending interrogation signals with one or more of the mid-dispenser transmit antennas 25 1. A response to either of these interrogation signals is received at a receive antenna mounted substantially above the customer, such as one of the top-mount receive antennas 257 or overhead receive antennas 261.

The basic operation of this embodiment begins (block 400) by alternately transmitting from the top and mid-mount antennas (block 402). The central control system 50 or dispenser control system 80 will monitor for responses from transponders within one of the interrogation fields (block 404). The control system will continue to monitor for a transponder response until a signal firom a transponder is received (block 406). The control system will next detennine from which transmission field the

transponder is responding (block 408). In this embodiment, where the transmission fields alternate, the control system will simply determine if a transponder response was received during a time period when the top or overhead-mount antennas were generating the interrogation field or if the response occurred during the time the mid-dispenser transmit antenna 251 was generating the interrogation field.

Once the control system determines the field in which the transponder is responding, the appropriate location of the transponder is known (block 410). Typically, the transponder's response to the interrogation signal provides transponder identification indicia indicative of the type of transponder being interrogated (block 412). The type of transponder is generally vehicle mounted or carried by the person. Determining whether the transponder is vehicle mounted or carried by the person enables the control system to determine how to react to the presence of other transponders passing through the various interrogation fields during a communication with another transponder or make sure a transponder is properly located for the desired transaction.

If the control svstem deten-nines the transponder is one carried by a person (block 414) and that the transponder was within the mid-antenna field (block 416), the control system allows the transaction to continue (block 420). If the transponder is a customer-carried transponder that is not within the mid-antenna field (blocks 414 and 416), the control system will return to the beginning of the process (block 418). The latter situation is indicative of a transponder carried by the person being interrogated in one of the top or overhead antenna fields, which are preferably used to interrogate vehicle-mounted transponders exclusively. Thus, the system preferably ignores transponders carried by the person outside of the mid-antenna field, which is preferably focused in a manner requiring the customer to be substantially in front of the customer interface of the appropriate fueling position. The field associated with the mid-dispenser transmit antenna 251 is limited only by design choice and may extend several or more feet in front and to the sides of the fuel dispenser.

If the control system is communicating with a customer-carried transponder within the mid-antenna field, the control system may monitor for the continued presence of the transponder in the mid-antenna field (block 422) or allow movement of the customer-carried transponder throughout the fueling environment (block 422). Notably, it is often desirable to only require the customer-carried transponder to be within the mid-antenna field long enough to start the transaction and fueling operation, and allow the customer to leave the fueling area during the fueling operation. Unlike a customer-carried transponder, the control system would preferably require the presence of the vehicle in the appropriate transmission field throughout the fueling operation for safety reasons. Regardless of how the control system monitors the presence or movement of the customer-carried transponder during the transaction, the transaction will continue until complete (block 426), wherein the process will begin anew (block 428).

If the control system determines a vehicle-mounted transponder is within the appropriate transmission field (block 414), the transaction will continue (block 430). Preferably, the control system will make sure that the vehicle has stopped moving and has been in position long enough to indicate a transaction associated with the responding transponder is likely. As noted above, the control system will preferably continue to monitor for the vehicle-mounted transponder's presence (block 432) throughout fueling. The control system is preferably capable of

distinguishing responses from the vehicle-mounted transponder associated with the transaction from other personal or vehicle-mounted transponders entering one or more of the transmission fields (block 434). If a response to an interrogation signal is received that does not correspond to the vehicle-mounted transponder associated with the transaction, the response is ignored (block 436).
Preferably, the control system will ignore all responses of customer-canied transponders in the top-mount or overhead transmission fields. Erroneous responses from other vehicles are rejected based on the control system recognizing a response from a vehicle-mounted transponder having a different identification indicia from the vehicle-mounted transponder associated with the ongoing transaction. Likewise, the control system will ignore responses from transponders other than the authorized transponders to avoid communicating with transponders of other customers entering the field during a transaction. In such case, the control system may check the identification indicia to ensure communication continue with the appropriate transponder. During this time, the control system will continue with the transaction (block 438) until the transaction is completed (block 440).

If the transaction is not complete, the control system will continue to monitor for the presence of the vehicle-mounted transponder and any other transponders in the area (blocks 432 - 440).

Once the transaction is complete (block 440), the process returns to the beginning (block 442).

Although the preferred embodiment provides for mid and overhead transmission fields wherein transponder responses are received near the top or above the dispenser, those skilled in the art will recognize that numerous modifications of this configuration are within the inventive concept disclosed herein and subject to the claims that follow.

As noted, the interrogation communications system preferably communicates using substantially directional radio frequencies in conjunction with antennas configured to provide precisely shaped and directed interrogation fields. Communications at these frequencies are generally limited to line-of-sight communications wherein arranging the antennas to cover a common interrogation field from different locations avoids parallax and the effect of interference from objects coming between the transponder and one of the antennas. Generally, communications will require the absence of metal objects coming between the antennas and transponders. Thus, when antennas are mounted within the dispenser, glass or plastic dispenser walls are preferable.

Furthermore, vehicle-mounted transponders are preferably placed on the windows or behind non-metal portions of the vehicle to avoid interference.

Preferably, high-gain antennas are used to provide a highly directional and configurable cone shape covering an area most likely to include a transponder when a vehicle is properly positioned for fueling. The antenna range and transmission power is typically adjusted to provide the desired interrogation field while minimizing the potential for the transponder to reflect signals to antennas associated with other fueling positions.

Another benefit provided by an embodiment of the present invention is that spread-spectrum communications limits the likelihood that an interrogator in the system will synchronize with a transponder being

interrogated by another interrogator. Thus, a preferred embodiment of the present invention provides for a communications system capable of distinguishing between transponder types, limiting the potential of transponders erroneously communicating with another interrogator, simplifying communications by using the same carrier for transmission and reception, extending the interrogation field to more easily communicate with vehicle-mounted transponders, reducing the size of the antennas required for communication, and allowing either the same or same type of antenna to be used for transmission and reception.

Alternate Antenna Configuration
Turning now to Figure 13A, an alternative fueling environment 10 is shown having a station store 20 and the central control system 50 configured to communicate with each of the dispensers 18. Multiple vehicles 14 are depicted in and around the various fuel dispensers 18.

Each of the dispensers may include an antenna 108. These antennas 108 may be operatively associated with a corresponding dispenser interrogator 52 and dispenser control system 80 (see Figure 5). Please note that antenna placement will depend upon the application and may include placing the antennas anywhere in the fueling environment IO separate from the dispensers 1 8.

Placing the antennas at non-dispenser locations is especially operable in applications where the antennas are used to determine transponder location.

The antenna 108 and dispenser 18 configuration in Figure 13A is specifically adapted to determine the proximity of a vehicle relative to a particular fueling position A, B associated with each dispenser 18. The different reception patterns are depicted in association with the two left most dispensers 18. The circular reception pattern 250 would be used to determine the proximity of a vehicle with respect to a particular dispenser 18. Generally, only one antenna 108 is required for such an embodiment. As a vehicle approaches the dispenser having the circular pattem 250, the dispenser's corresponding interrogator 52 and dispenser control system 80 will receive a signal transmitted from the transponder 12, 14. The dispenser control system 80 will analyze certain characteristics of the signal received from the transponder, such as magnitude or strength, to determine a relative proximity to the dispenser. Typically, a dispenser 18 having an antenna configuration providing the basic circular pattern 44 is not able to distinguish at which side or fueling position A, B, the vehicle is positioned.

A dual-lobed pattern 252 associated with the second dispenser 18 from the left in Figure 13A provides the dispenser control system 80 the ability to determine at which fueling position A, B the vehicle is located or approaching. In order to determine the particular fueling position A, B, a directional component is necessary in addition to the proximity component described above. To provide this directional coniponent@ multiple antennas may be used to create various types of reception lobes where the antennas may be configured to only receive signals from certain pre-set directions or areas. Regardless of the configuration, the dispenser control system 80 will monitor a characteristic of the signal determinative of proximity, such as magnitude or strength, in conjunction with determining the fueling position A, B to which the signal appears most proximate. In the dual-lobed embodiment 252, the dispenser control system 80 may measure the signal characteristics received at both antennas 108 to determine from which antenna the received signal was strongest in order to determine direction. Using directionally configured

antennas will allow each antenna to focus on one fueling position. Alternatively, placing the antennas 107 in the forecourt under each fueling position allows for easy deten-nination of vehicle placement relative to a fueling position as shown in Figure 16.

The dispenser control system 80 may include electronics capable of detecting signal strength or magnitude and monitor for variations therein. The magnitude monitoring circuitry 256 preferably includes automatic gain control electronics feeding the received signal into an analog-to-digital converter. Signal strength is turned into an 8-bit digital string corresponding to a signal magnitude. The dispenser control system 80 will monitor the string for variations in signal strength. As the signal magnitude increases, the dispenser control system 80 will determine that the transponder is approaching, and vice versa.

The flow chart of Figures 14A and 14B outlines the process undertaken by the dispenser control system 80 to determine the proximity or location of a transponder 64, 66 with respect to a particular fueling position A, B of a dispenser 18. The process begins (block 700) with the dispenser control system 80 beginning to monitor for a transponder signal (block 71Q). The signal may originate from an active transmitter in the transponder or may reflect or scatter back to a dispenser interrogator 52 and antenna 108. Upon detection of a transponder signal (block 720), the dispenser control system 80 will monitor a characteristic, such as magnitude or phase of the signal (block 730). At this point, the dispenser control system 80 recognizes a transponder 64, 66 as near or approaching the dispenser 18 and continues to monitor for the presence of the signal (block 740). If the signal is lost or decreases, the dispenser control system 80 will detennine that the transponder has left or is leaving the reception area and will begin to monitor for a new transponder signal (block 7 1 0). If the signal remains present and/or increases, the dispenser control system 80 will deten-nine the proximity of the vehicle with respect to the dispenser (block 750). Preferably, the dispenser control system 80 will monitor to determine whether or not the signal strength is changing to ensure that the vehicle-mounted transponder 64 does not move during the fueling operation.

In order to determine the particular fueling position A, B at which the transponder is located, the dispenser control system 80 must determine which side of the dispenser the vehicle is at or approaching (block 760). The dispenser control system 80 may simply monitor the signal with antennas at or near the particular fueling position designed to receive using a directionally sensitive antenna configuration, such as the embodiment of Figures 12A and 1213, the dual-lobed configuration 252 of Figure 13A, or the underground antennas 107 shown in Figure 16.

Reference is again directed to Figures 14A and 14B. As a transponder approaches a particular fueling position A, B, the dispenser control system 80 determines if the transponder is within a certain fueling proximity (block 770). When the vehicle is within fueling proximity, it is in a position close enough for the fuel dispenser 18 at the corresponding fueling position A, B to allow fueling of the vehicle. If the vehicle is not within fueling proximity, the dispenser control system 80 continues to monitor the strength and direction of the signal (blocks 730-760). The dispenser control system 80 may determine whether the transponder or vehicle is within fueling proximity by simply receiving the transponder signal, receiving a signal magnitude above a predefined threshold, and/or detennining whether the signal magnitude is changing, indicating that the transponder and vehicle are moving.

Once the vehicle is in position for fueling, the dispenser control system 80 activates the dispenser's fueling electronics as desired (block 780). During the fueling operation, the dispenser control system 80 continues to monitor for the presence of a signal in decision block 790. When the signal is no longer present, the dispenser electronics are deactivated at block 795, and the dispenser control system 80 monitors for the next transponder signal at block 7 1 0 causing the process to repeat.

Figure 13B depicts an embodiment wherein the location of transponders may be **tracked** as they travel throughout the service station environment 10. In this embodiment, the dispensers 18 each include an antenna 108 capable of receiving a signal from a transponder 64. Preferably, signals from the antennas 108 are multiplexed together at the central control system 50. The various control systems will receive the transponder signal and monitor the location of the vehicle and determine the dispenser I 8 and fueling position A, B at which the vehicle stops.

The dispenser control system 80 may, for example, monitor a characteristic, such as the phase, of the signal received by the various antennas 108 associated with the dispensers 18 and use known computational techniques, based on the signal characteristics received at the various antenna locations, to determine vehicle location. One such technique using phase differences is triangulation.
Although the signal of only one vehicle transponder 64 is depicted, the various dispensers 18 and/or the central control system 50 may monitor for the presence and location of a plurality of vehicles to determine proximity, direction of travel and location throughout the fueling environment IO. Triangulation and other similar positioning and locating techniques generally require at least two antennas and provide better resolution as the number of antennas 108 increase. The location of the respective antennas 108 may be virtually anywhere in the fueling
I
environment I 0. Another alternative to multiplexing the various antennas located at the respective dispensers 18 or elsewhere in the fueling environment 10 is to use multiple antennas in each dispenser or throughout the fueling environment IO. Additionally, a global positioning system (GPS) could be used to communicate vehicle position directly or through a remote network 94 to the central control system 50 and on to the fuel dispenser 18.

The flow chart of Figure 15 outlines the control process for the embodiment depicted in Figure 13B. The process begins (block 800) and initially monitors for the presence of a transponder signal (block 810). Once the signal is received (block 820), the dispenser control system 80 monitors the characteristics of the signal for various antennas (block 830). The dispenser control system 80 will next determine the location of the transponder (block 840) using the monitored signal characteristics at the various antennas to triangulate or otherwise determine vehicle location. The precise fueling position A, B of the corresponding dispenser 18 is determined (blocks 850 and 860) by calculating the position at which the vehicle stopped. The dispenser control system 80 for the dispenser where the vehicle stopped will determine if the vehicle is within the fueling area (block 870). If the vehicle is within the fueling area, the dispenser's fueling electronics are activated as desired (block 880). The dispenser control system 80 will continually monitor the location of the vehicle to determine if the vehicle remains within the fueling area (block 890). Once the fueling operation is over and the vehicle leaves the fueling area, the dispenser control system 80 deactivates the dispenser's fueling electronics (block 895) and monitors for a new transponder signal (block 8 1 0), whereupon the process is

repeated.

With respect to Figure 16, an embodiment depicting underground antennas 107 is shown. The two antennas 107 correspond to fueling positions A and B. The antennas are preferably multiplexed at an antenna multiplexer 256. The multiplexer 256 sends the multiplex signals received by the corresponding antenna 107 to the interrogator 52. Preferably, intrinsically safe barriers are used to provide electrical isolation between the antennas and the multiplexer 256 and/or interrogator 52.

Dual-Stage Preconditioning and Authorization Using Transponders
There are numerous examples of transponders being used in fleet-type applications for identifying a vehicle as being authorized to receive fuel at a specific fueling site. There are examples of radio frequency transmissions being used to interface with onboard vehicle computers for the purpose of transferring vehicle information to various locations, such as toll plazas, fuel dispensers and parking garages. A number of schemes are known for identif@@ing an individual for completing financial transactions. These typically involve personal identification numbers (PIN), which are "secret" codes known only to the consumer and used in conjunction with financial account information in order to complete a transaction. These schemes typically include standard debit cards with associated PIN's, contact and contactless smart cards with associated PIN's, and smart-wired and wireless PIN pads used in conjunction with card reading devices such as the devices disclosed in U.S. Patent No. 4,967,366 to Kaehler.

Consumers have reacted favorably as the petroleum retailing industry has accepted card readers in the dispensers as a means for reducing the time required to complete payment for gasoline transactions. However, both consumers and the industry desire still further improvements of transaction efficiencies. One aspect of the current invention is to use transponder technology in a fueling environment to simplify the financial payment operation associated with the transaction at a fuel dispenser and provide an enhanced level of security such that basic transponder communications cannot be "tapped" by unauthorized devices and personnel in order to replicate communications to generate fraudulent transactions. This aspect involves an initial radio frequency identification process to provide preconditioning of the fuel dispenser, followed by an authentication process to provide transaction security for the financial aspects of the transaction. The invention is applicable to both vehicle-mounted 64 and personal transponders 66, and, in certain embodiments, may require a second transponder associated with the vehicle or customer for the authentication step. The secondary authentication process may require the customer to enter a PIN, speak for a voice match, or supply a physical identifier, such as a fingerprint, or other biometric identifier. Preferably, a voice print or other biometric signature of the customer is taken and stored in the transponder's memory or a database associated with the dispenser control system. Thus, the information must be received from the transponder or the database associated with the dispenser control system as necessary. Alternatively, a second transponder may be used for part of the process to supplement and authenticate the first transponder, or the first transponder may act alone and provide a secondary transmission capable of authenticating the first transmission.

Attention is drawn to Figures 17, 18A and 18B wherein a schematic and flow chart are depicted detailing the system and process of a preferred embodiment implementing dispenser preconditioning followed by a transaction authorization. In Figure 17, a vehicle 14 has a first

vehicle-mounted transponder 64 and a second vehicle-mounted transponder 65. The customer 12 may also have a personal transponder 66. Although not depicted, fuel dispenser 18 is preferably connected as discussed above with tile central control system 50, and includes a customer interface having a display 100 and key pad 102, a dispenser interrogator 52 and an associated antenna 108. The dispenser may also include a microphone 258 operatively associated with audio processing circuitry 260 (see also Figure 5) and a video camera 262. The microphone 258 and camera 262 may provide a bi-directional audio/video intercom between the dispenser 18 and the QSR or convenience store operator interfaces. In this application, the microphone 258, in conjunction with the audio processing circuitry 260 or the camera 262, may function to provide a voice print of the customer or an image of the customer to authenticate a transponder. Likewise, a fingerprint imager 264 may use a customer's fingerprint to authenticate the transponder.

With this dispenser architecture in mind, specific reference is made to the flow chart of Figures 18A and 18B. As a customer 12 approaches a fueling station (within vehicle 14), and, in particular, a fueling position at a dispenser 18, either the customer transponder 66 or vehicle transponder 64 is initially interrogated as the interrogator 52 monitors for the presence of a transponder (blocks 900 and 905). Typically, the interrogator 52 in conjunction with the dispenser control system 80 will continuously check to see if a transponder is present (block 910). If a transponder is not present, the dispenser control system 80 will continue to monitor for the transponder (block 905). If a transponder is detected, the dispenser control system 80 will receive indicia from the first transponder corresponding to the particular transponder's identification information (block 915). Preferably, the dispenser 18 will continuously monitor the transponder's location or proximity to a particular fueling position (block 920). Further information is provided relating to vehicle monitoring and positioning in applicants' U.S. Patent Application entitled INTELLIGENT FUELING filed on December 6, 1996, Serial No.

08/759,733, the disclosure of which is incorporated herein by reference. Typically, the transponder is read using energy provided from the antenna 108 located on the dispenser 18, forecourt 16, or anywhere else in the fueling environment 10. The transponder may respond to this energy by providing signals to the dispenser interrogator 52. The dispenser control system 80 will operate to determine the general location or proximity of the vehicle 14 with respect to a corresponding fueling position at the fuel dispenser 18. Preferably, the dispenser interrogator 52 will maintain constant contact with the transponder. The dispenser control system 80 will monitor transponder communications to determine the fueling position at which the vehicle (and customer) stop (block 925).

Once the appropriate fueling position is determined, information received from the vehicle (or customer) transponder is used to "precondition" the fuel dispenser 18 (block 930).

Preconditioning means readying the dispenser for the fueling transaction. The extent of readiness may vary with each application, but may include determining the proper fuel, fuel type, flow rates for the vehicle and/or running initial checks on account information, adjusting vapor recovery equipment based on the absence or presence of onboard vapor recovery equipment, or simply initializing the pump electronics. For example, a fuel dispenser may be preconditioned to a point where fueling will be authorized once secondary information is received to authorize the information used for preconditioning and/or the transponder. The customer may also elect to receive select information or targeted advertising as

discussed below under "Customer Preferences." The preconditioning may take place solely at the fuel dispenser control system 80, in conjunction with the central control system 50, or may require communication with an on- or off-site database., such as the remote network 94. Having achieved the preconditioning of the dispenser based on a first transponder indicia, which is generally related to transponder identification, the financial aspects of the transponder are subsequently authorized.

Receiving additional or second indicia is required for authorization in addition to the indicia received for preconditioning (block 935). One option is to have the dispenser control system 80 adapted to prompt the customer to enter a PIN on the key pad 102 so that both the transponder data and an associated PIN number are made available to the appropriate database as a matched pair in order to obtain authorization and subsequent payment infori-nation (block 940).

Another option is to receive the second indicia from a second transponder, distinct from the first transponder that initially transmits the information for preconditioning (block 945). In this embodiment, the first transponder may be either an additional transponder 65 on the vehicle 14, or the personal transponder 66 carried by the customer 12. If the first or preconditioning transponder is transponder 64 on the vehicle 14, the second transponder providing authorization may be a customer transponder 66 or the other vehicle transponder 65. If the first or preconditioning transponder is the customer transponder 66, the second transponder may be one of the vehicle transponders 64, 65.

As easily seen, many configurations are available where a first transponder transmits information for preconditioning, and a second associated transponder provides information for authorization. Once the first transponder provides the preconditioning indicia, the second transponder will subsequently provide second indicia from which authorization or authentication is derived. This secondary indicia may be an authentication ID which is matched in a database in one of the associated control systems with the ID or information received from the first transponder. If the inforination from both transponders corresponds appropriately, the transaction is authorized.

A third alternative is to provide a transponder capable of providing both the first preconditioning indicia followed by a secure or encrypted transmission representing the second indicia required for authorization or authentication (block 950). Preferably, the transponder is capable of processing data received from the dispenser interrogator 52, processing or encrypting the data and transmitting the data or secure code back to the dispenser for authorization or authentication. Again, one of the control systems associated with the dispenser will compare the original preconditioning indicia and the second authorization or authentication indicia before authorizing the financial portion of a transaction and allowing the dispensing of and payment for fuel.

When only a customer transponder 66 is present (the vehicle transponder is not present), the transaction is initiated or preconditioned solely by the customer transponder 66 located on a key, key fob/ring or card. Upon selecting a fueling position, the customer will exit the vehicle and prepare for fueling. Preferably, the dispenser will read the customer transponder 66 and recognize that a vehicle transponder is not present. Such recognition may result from a vehicle transponder not being detected or information transmitted by the personal transponder indicating that a personal transponder is present or a vehicle transponder is not available. In this situation, the dispenser will prompt the customer for

a PIN, which is compared with the information received from the transponder in order to authenticate the transaction. Optionally, the customer transponder is a secure, intelligent transponder capable of being read by the dispenser interrogator, providing infon-nation such as a code, performing a secured computation at the transponder, and responding with secondary information in order to validate the transponder and authorize the transaction.

Another option for secondary authorization or authentication indicia is to receive a voiceprint using the microphone 258 and audio processing circuitry 260 in conjunction with one of the associated dispenser control systems. Fingerprints may also be compared using the thumb- or fingerprint imager 264 (shown in Figure 5).

Regardless of how the second indicia for authorization or authentication is received, one of the control systems will check the second indicia for authorization purposes as discussed above (block 955). If the control system determines the second indicia is not proper authorization or authentication of the first, preconditioning indicia, the control system will display a message indicating the transaction is not authorized (block 965) and will prevent fuel delivery. If the transaction is authorized (block 960), the control system will enable fueling (block 970) and monitor for the end of fueling (blocks 975 and 980) until the transaction ends (block 985).
With the embodiments requiring second indicia from the same or separate transponder for authentication or authorization, the transponder is adapted to bi-directionally communicate with the dispenser, which further communicates with a host network 94 in cooperation with the central control system 50 to provide secure authorization of the transponder(s) and to enable transactions. In certain applications, it is desirable to avoid transmitting data from which valuable account or financial information could be derived between the tag and the dispenser, or the dispenser and the host network 94. Preferably, all or a majority of the account or financial information requiring absolute security is stored only at the host network 94. Thus, in the preferred embodiment, neither the transponders, dispenser- I 8 nor central control systern 50 has access to critical financial or account information. In more localized applications, the central control system 50 may have access to such information.

Certain embodiments of the present invention also provide high levels of security for transmissions. In order to avoid placing certain information at risk during transactions, the invention provides a unique identifier indicia for each transponder, and the host network maintains account and financial information associated with the transponder having the unique identifier. The identifier is transmitted to the host network 94 through the dispenser 18 and central control system 50. The host network 94 checks to see that the transponder, and not a counterfeit, has provided the identifier. Once the host system determines that an authorized transponder sent the identifier, the host network 94 authorizes the dispenser to further interact with the transponder and authorize subsequent transactions based thereon.

Preferably, the transponder is authenticated using cryptography techniques known only by the transponder and host, but not by the dispenser or central control system 50. The preferred authentication or authorization process is shown in Figure 19. In step one, the dispenser control system 80, in conjunction with the dispenser interrogator 52, generates and sends a random number (CRN) to the transponder. The transponder will encrypt the random number (CRN) and return the encrypted

random nurnber (TRN) to the dispenser along with a transponder identification number (ID) in step two. In step three, the dispenser 18 relays the transponder ID, the encrypted random number (TRN) received from the transponder, and the random number (CRN) to the host network 94 without modification. When using the host network 94, this information is transferred through the central control system 50. In more localized applications, the primary functions of the host network 94 may be provided by the central control system 50. In the preferred embodiment, the tag ID number is 10 bytes, the random number (CRN) is 8 bytes, and the encrypted random number (TRN) is 8 bytes.

Upon receipt of the transponder ID from the dispenser 18 (through central control system 50), the host network 94 calculates or looks up in a database a main transponder key associated with the transponder using the transponder ID. Preferably. the host network 94 will have initially generated the main keys stored in the transponder and will use the same keys to cryptographically communicate with the transponder. The host network 94 will have cryptography electronics adapted to encrypt the random number using the main transponder key and compare the result to the encrypted random number received from the transponder. If the numbers match, the transponder is a valid transponder, and most likely not a counterfeit. The host network will then use the ID number to look up transaction billing data or other customer related information corresponding to the transponder and authorize the dispenser to carry out the desired and authorized transactions in step four. Additional information is provided in U.S.

Patent Application Serial No. 08/895,417 filed July 16, 1997, entitled CRYPTOGRAPHY SECURITY FOR REMOTE DISPENSER TRANSACTIONS in the name of William S.
Johnson, Jr., the disclosure of which is incorporated herein by reference.

Transponder Theft
With the enhancements and transaction efficiency associated with using transponders, security concerns arise based on theft of information transmitted to and from the transponders, as well as theft of the transponders themselves. The present invention addresses the issue of stolen transponders in a number of ways. Preferably, a database is maintained, which keeps **track** of stolen or lost transponder ID's and is checked by the dispenser or central control system prior to authorizing each fueling operation in which transponders are used. The database may be kept at the dispenser, central control system 50, or at the remote network 94 for more regional and national protection. Where the transponder is intelligent, the dispenser control system 80 deletes a fraudulent transponder. The dispenser control system 80 may send a signal to the transponder 64, 66 to disable the transponder, act to inhibit future transactions, or alert other fueling environments when subsequent transactions are attempted.

The basic flow of this theft deterrent and prevention system is shown in Figure 20 wherein a fueling process begins (block 1000) and the transponder ID is received (block 1005). In addition to the transponder ID, the transponder may inform the dispenser control system 80 that the transponder has been stolen or is being used by an unauthorized party. This theft or unauthorized use signal is preferably generated by the transponder in response to a dispenser in a subsequent transaction attempt transmitting a form of disabling signal to the transponder.

Transmission of this signal is described in greater detail below.

The dispenser will next determine if the transponder is lost or stolen based on the signals received from the transponder by accessing a local or national database listing transponders which were lost, stolen or used by unauthorized parties (block 1010). After comparing the transponder ID with those listed in the database, the dispenser will decide whether or not the transponder is lost, stolen or being used by an authorized party (block 10 1 5). If the transponder does not appear in the database, the dispenser will proceed with the fueling transaction (block 1020) until the end of the transaction is reached (blocks 1025 and 1030). If the dispenser deten-nines that any use of the transponder is unauthorized from any one of the local or national databases, the dispenser will preferably interrogate the transponder to download any transaction history or information available on the transponder to help **track** unauthorized uses and determine the identification of the unauthorized user (block 1035). For example, the transponder may be able to **track** the various locations in which the user attempted to use the transponder. If the user attempted to use any identification means in association with this transponder use, the prior dispensers and control systems may have attempted to transmit this user identification to the transponder for subsequent transaction attempts.

As noted above, an important aspect of one embodiment of the present invention is the dispenser's ability to transmit a disable signal to the transponder to prevent authorizations of unauthorized users and subsequent transaction attempts (block 1040). The disable signal may simply be a signal informing the transponder that any subsequent use is unauthorized. The signal may completely shut down the transponder to prevent any subsequent communications or disable any transaction authorization features while maintaining communication ability. In the latter case, the transponder may be used to help **track** unauthorized transaction attempts and identify the unauthorized user.

The dispenser will also disable the present fueling operation and attempted transaction (block 1045) before delivering fuel or authorizing a financial transaction associated with the transponder. During this time, the dispenser will attempt to gather as much customer infon-nation as possible (block 1050). For example, the dispenser control system 80 may mark any type of identification infori-nation received from the user as well as record any physical information possible, such as marking video taken from the camera 262 or audio from microphone 258 (block 1050). The system may also alert one or more of the operators of the fueling environment and one or more security services via the local or remote systems (block 1055). The system may be tied into a network which will alert the police or simply update the security database in order to maintain transaction or attempted transaction histories (block 1060) and the process will end (block 1030). Upon determining a transponder has been lost, stolen or used in an authorized manner. the system may communicate with the transponders to effectively lockout the dispenser as well as the transponder. Those of ordinary skill in the art will recognize that the preferred embodiments disclosed herein will not limit the inventive concept disclosed or protected by the claims that follow.

Drive-Off Prevention

Similar to the theft prevention and general prevention of transponder use by unauthorized persons, steps must be taken to prevent authorized customers from using the transponder in unauthorized ways. Of primary concern is preventing a customer from driving off before paying for the fuel or any other purchases made at the dispenser or anywhere else in the fueling environment. In many situations, the complete financial

transaction will require more than a purely remote interaction between the dispenser and transponder. The customer may be required to provide additional payment means, such as cash, a credit/debit/smart card or PIN number. In a situation where the product or service may be delivered before the transaction is completed, or especially when the transponder is used for reasons other than payment, the present invention will act to deter or prevent repetition of this event in the future. Notably, not all drive-offs are intentional, and the transponder may act Nvith various fueling environments to remind the customer at a subsequent fueling transaction that a drive-off occurred during a previous operation.

The flow of an embodiment of applicanf s drive-off prevention process is shown in Figure 21.

The fueling operation will begin (block I 1 00) wherein the dispenser will receive transponder identification indicia, which is generally the transponder ID (block 1105). The dispenser control system 80 and/or central control system 50 will monitor the transaction to detect a drive-off condition (blocks II 10, II 15). The system will generally monitor for the drive-off condition until the transaction is both physically and financially complete.

If a drive-off condition is detected (block 1 1 15), the dispenser will transmit a drive-off signal to the transponder indicating the drive-off condition has or is occurring. The system will quickly gather any customer information from the transponder and from the fueling environment (block 1125) in the same fashion discussed with transponder theft. The dispenser will also alert the system operator, security personnel and, most importantly, the customer (block 1130). In many situations, the customer may have simply forgot to complete the transaction or may decide to abort the attempted drive-off after hearing the alert. If a drive-off occurs.in spite of these warnings, a database associated with the local central control system 50 or the remote network 94 is updated accordingly. Once this database is updated, subsequent transactions will be prevented when the database is accessed to determine if prior drive-offs have occurred (see block I I IO). Alternatively, a transponder disable signal may be sent to the transponder before leaving the fueling area to lockout future transactions, as discussed in the previous section. The customer may be informed of the drive-off at the subsequent location in an attempt to perfect the prior transaction in which the drive-off occurred. Additionally, tile transponder could act to disable the car if such control electronics are available and coupled to the transponder.

Transaction Guidelines and Limitations

Another unique aspect of an embodiment of the present invention is the ability to use transponders to provide guidelines and limitations on transactions associated with the transponder. These transactions may be cash, credit or debit type transactions so long as a transponder is communicably associated with the dispensing system somewhere before, during or after the fueling or purchase transaction. These guidelines and limitations on customer purchases are either stored in a database in association with a transponder ID and accessible by the dispenser or central control systems 80, 50 or transmitted from the transponder to the dispenser during each transaction. Regardless of the mariner of access, the dispenser control system 80 and the central control system 50 will cooperatively operate to carry out transactions according to these guidelines and limitations.

Attempts to circumvent the guidelines or limitations will preferably

result in a message to the customer or operator that the item or service presented for purchase is not available to that particular customer when the transaction is associated with the customer transponder. These guidelines and limitations may affect both fueling and non-ftieling transactions. The guidelines and limitations may be used to set a particular dollar amount or limit what the customer associated with the transponder may spend, as well as limit the frequency and the types of purchases made by the customer. For example, parents may place limits on their children's spending amounts, snack purchases or the frequency of fill-ups, in addition to preventing the purchase of alcoholic beverages. Given the tremendous latitude made available with using such transponders for transactions, authorization controls provide safety and security features making the tasks of those supervising the customers associated with the transponders significantly easier. The invention is particularly useful for fleet fueling applications wherein drivers are limited to selected purchases and purchase amounts.

With these concepts in mind, attention is directed to Figure 22 depicting a general flow of a fueling or purchase transaction wherein transponder guidelines or limitations are enforced.

Typically, the fueling operation will begin by a customer driving up to a fuel dispenser and an associated transponder transmitting identification indicia to the dispenser (block 1200). The dispenser control system 80 will receive the transponder identification indicia via the interrogator 52 (block 1205). At this point, the dispenser control system 80 and/or the central control system 50 will receive transaction guidelines from a database kept at the central control system 50 or the remote network 94. Alternatively, the dispenser control system 80 may receive the transaction guidelines directly from the transponder (block 121 0).

Throughout the fueling operation, one or more of the control systems will monitor the operation to maintain fueling according to any guidelines or limitations as set forth above (block 1215).

Additionally, the control systems will operate to monitor non-fuel transactions occurring before, during or after fueling to ensure that any guidelines or limitations are followed (block 1220).

The non-fuel transactions may take place at the dispenser 18 or at one of the transaction terminals 30, 34 in the fuel station store. The control systems will monitor the purchases entered into the graphical user interface or scanned in by the operator. If the type, amount or frequency of the purchase is not within the guidelines or limitations, any such items are identified and the operator is alerted as necessary (block 1240).

If all of the fueling and non-fueling transactions are within the guidelines and limitations, the transaction is authorized (block 1230) and the transaction is ended (block 1235). The portions of the transaction which are authorized, if any, are allowed (block 1245) and the transaction is ended (block 1235).

Creating A Shadow Ledger

Given the significant advances in remote communications technology, remote communications units, or transponders as referred to herein, have ever increasing computational capabilities. As shown in Figures 4A and 413, the transponders may have one or more controllers 124, 142 and a significant amount of associated memory 126. As noted, the transponders may be passive or active and may provide significant data processing and

memory storage. In these "smart" transponder embodiments, it is preferable to keep a running tally of financial and transactional information. This is especially useful in smartcard-type embodiments wherein the transponder will actually provide prepaid functions directly on the transponder. In order to provide additional transaction security and **tracking** , a ftirther aspect of the present invention is creating a shadow ledger at the central control system 50 or the remote network 94 of the transaction information stored on the transponder. This shadow ledger is updated during communications with the transponder. In this manner, transponder account information may be checked and the shadow ledger may be updated regarding transactions occurring outside of the fueling environment or associated transaction network.

Turning now to Figure 23, a block diagram of the transponder 12, 14 is shown having controller communication electronics 124, memory 126 and software 128 sufficient to provide a transponder ledger 270. The transponder 64, 66 will communicate with a fuel dispenser interrogator 52 of a fuel dispenser 18. The fuel dispenser control system 80 will cooperate with the central control system 50 and its controller 232 to provide transaction and other transponder information to a remote network 94. The remote network 94 includes sufficient memory to provide a network ledger 272 for the particular transponder 64, 66 in communication with the fuel dispenser 18. The network ledger 272 is compared and updated as necessary during transactions involving the transponder 64, 66. Alternatively, a local ledger 276 may be kept at the central control system in memory 234.

The basic process of maintaining a shadow ledger apart from the transponder is shown in Figure 24. As a transaction process begins (block 13 1 0), the dispenser 1 8 will receive transponder identification indicia (block 1320). The identification or other indicia may also indicate whether or not a transponder ledger is being kept or provide sufficient information to allow one of the control systems associated with the dispenser to access a database indicating whether or not there is a ledger for that particular transponder.

Next, the transponder will download the information in the transponder ledger 270 to the dispenser interrogator 52 and controller 80. The dispenser control system 80 will subsequently relay the transponder ledger information to the central control system 50 if a local ledger 276 is kept or relay the information to the host network 94, if a network ledger 272 is provided. The shadow ledger (local or network) is accessed for the particular transponder using the transponder identification indicia (block 1340) and the transponder and shadow ledgers are compared (block 1350). If the ledgers equate, no update is necessary and the process is ended (block 1360 and 1380). If the ledgers do not equate (block 1360), the shadow ledger is updated (block 13 70) and the process is ended (block 13 80). Keeping a shadow ledger and updating it as necessary when communications are available with the transponder provides additional security for transponder transactions, indicates transactions occurring outside of the ledger system or associated network, and provides an up-to-date accounting accessible when the transponder is unavailable for communications.

Transaction **Tracking**

The present invention also provides an embodiment adapted to **track** transponder transactions throughout a number of fueling envirom-nents operatively associated with the host network 94.

The basic flow of transaction **tracking** is shown in Figure 25 wherein a typical fueling operation begins (block 1400) by a transmission from the

transponder of transponder identification indicia to the dispenser 18 (block 1410). During the transaction, transaction information is received from the transponder and/or gathered by the dispenser and central control systems (blocks 1420 and 1430). The inforrnation received and gathered preferably includes information such as the type of transaction, the dollar amount per transaction, frequency of transactions, and the location of these transactions. The information gathered by the central control system 50 may be relayed to the host network or major oil company network 94 (block 1440). The information is updated and compiled at the host network (block 1450) to enable study of customer activities and transactions. This information is very valuable in advertising and merchandising in the fueling environment. Once the information is compiled at the network 94, the process is ended (block 1460).

Customer Preferences

The evolution of fuel dispensing stations has resulted in the development of faster and more efficient ways to dispense and pay for fuel. In the past, customers had to go inside a store to pay an attendant for dispensed fuel. Now systems exist that allow customers to pay for fuel at the dispenser with a credit or debit card without personally paying an attendant and without having to go inside a store. As a result of paying at the pump rather than personally paying an attendant inside a store, customers are less frequently going inside the convenient stores and, therefore, less often exposed to convenience store products and promotions, which are generally more profitable than fuel. These newer fuel dispensing stations give the ability to display visual information to the customer and prompt the customer to physically interact with the fuel dispensing station before, during and after dispensing fuel.

It is well known in the art of fuel dispensers to provide a CRT or other type of screen to deliver instructions, graphics and pictures during the fueling process. Currently these display screens, for the most part, are only used to give the user of the fuel dispenser more aesthetically pleasing instructions during the fueling process. One new feature of the display includes the ability to provide video intercom as disclosed in Gilbarco US Patent Application Serial No. 08/659,304 entitled ENHANCED SERVICE STATION FUNCTIONALITY filed June 6, 1996, the disclosure of which is incorporated herein by reference. This display also provides the ability to display video presentations, including advertisements.

With so much information available that can be displayed, a problem exists on how to manage and provide the information to the customer. It is desirable to have the ability to deliver the data on the screen at a fuel dispenser from outside sources such as satellites or data networks. That way, this data which usually requires large memory areas to store since it includes video data does not have to be stored locally at every fuel dispensing station. Rather, a central provider can deliver the information to the fuel dispenser so that it does not have to be stored redundantly at each fuel dispenser location.

With the current wave of data network technology, including the Internet, the ability to deliver information to a customer will continue to evolve. For instance, U.S. Patent Application Serial No. 08/896,988 filed July 18,1997, entitled INTERNET CAPABLE BROWSER DISPENSER ARCHITECTURE to Leatherman et al., incorporated herein by reference, discusses an interactive fuel dispenser having a plurality of fuel dispensers operating in conjunction with a local server in which each fueling position acts as a client of the local server at the fuel station store. This local server could be connected to any variety of networks to

provide information at the fuel dispenser, including the Internet. This invention discusses how the fuel dispensers and station will be connected to data networks to allow information to be delivered to a user, but it does not discuss the problem of how this information will be managed at the fuel dispenser. A user of a fuel dispenser may not have the expertise nor the time to access the information he desires in a reasonable amount of time due to the huge amount of data available today over the data networks and the fast changing availability of different and new types of information and data ftom data networks or the Internet.

A need exists to provide a way for the user of a fuel dispenser to easily retrieve the information he desires without time consuming selections that must be made for each use and without the confusion that may be caused by continuous changes in available selections and the format in which they are displayed on a screen at a fuel dispenser. One can envision the plethora of information selections that will be available to the user of a fuel dispenser in the future. It will be quite time consuming for the user to traverse a web of menus to select the information desired when the choices of selections become greater and greater. It can also be appreciated that changes in the information available for selection may make the user frustrated if the user wants the same type of information generally and does not want to access different types of information each time.

The present invention allows a customer to pre-select which types of information he wishes to access at a fuel dispenser station or other station. With the current systems in the fuel dispensing industry, a customer uses a credit card to initiate and authorize a fuel transaction.

The customer card number is read by the fuel dispenser and sent back to the fuel site controller.

The fuel site controller sends the credit card number to a host network through modem or other data network communications. The host computer looks up the credit card number and authorizes the fuel transaction with a message back to the site controller. Every time the customer uses the particular credit card to authorize a fuel transaction, the host computer may not only authorize the card, but also look up the pre-registered information stored for that particular credit card and send a message back to the site controller indicating the customer's preferences. The site controller could provide this infon-nation to the customer automatically at the fuel dispenser without having to make any selections.
The manner in which pre-registration for credit cards may be accomplished could be by an application that is sent to the credit card or fuel card companies indicating the choice of information to be delivered. For example, the information choices could include weather reports, local traffic reports, stock reports.. etc.

An improvement in the site controller's deten-nination of customer preferences is through the use of a transponder. As noted, the transponder can be hand-held or car mounted. The car mounted version of the transponder may be linked with the car's control system.

The transponder could reserve some of its user memory to store customer preferences.

Whenever a customer uses the transponder to authorize a fuel transaction, the transponder ID may be sent by the fuel dispenser to the site controller and on to the host network so that the credit or fuel card

number can be associated with the transponder ID to which the fuel will be charged. During the authorization process, the fuel dispenser interrogator could also interrogate the transponder for the customer's information preferences locally rather than having to obtain this information from the host computer. This method would save bandwidth and access time by the site controller to the host computer.

The user of the fuel dispenser must have a method for indicating and storing which type of information is to be registered and delivered to the customer each time a fueling transaction takes place. The user must also have the ability to change this information whenever needed.

There are several ways to accomplish this task.

For the credit or fuel card method, the credit card or fueling card companies could provide a database to allow a customer to pre-register which types of infon-nation he wishes to be displayed whenever he dispenses fuel with the particular credit card or transponder. The customer could access this database for selections by automated telephone service or other means. This pre-registered infori-nation would be stored in the host computer. The host computer would send a message to the site controller indicating which inforination. the customer desires. This message may only include the type of information to be displayed and not necessarily the actual information itself. The site controller may have links to other data networks or systems to provide the actual infori-nation. The site controller or individual fuel dispenser would make the decision on what type of information to provide and what source to provide it from.

The transponder arrangement provides a couple of easy ways to pre-register data desired on a transponder. The customer could select the type of information to be displayed when initially applying for the transponder to be linked to the customer's credit card. Alternatively, the fuel dispenser itself could have a menu and selection available for the customer to select the information desired and the fuel dispenser could download the information to the transponder.

With the credit or fueling card embodiment, the customer can use an automated phone service to access a database which stored the pre-registered information selections, or the credit/fuel card company could provide an application to be mailed in and entered into the database by an operator.

With the first arrangement, the customer could also change his selection at the fuel dispenser by selecting the option to change his pre-registered selections, or a computer could be provided inside a convenience store for the same purpose. The computer or ftiel dispenser would simply have an interrogator capable of communicating with the transponder to store the pre-registered selections made by the customer. Of course, if the customer begins the fueling process and wishes to override or cancel the pre-registered information to be delivered, he can do so with a selection at the fuel dispenser.

At this point, the customer may traverse through any menus provided to access other information not pre-registered, or may choose to not have any information provided to him at all. In the case of a data network service provider connection, the customer could opt out of the pre-registered data and surf his account or service just as he would on his personal computer.

As discussed above, the present invention provides features adapted to personalize a fueling operation on a customer-by-customer basis. In operation, the dispenser 18 will generally interrogate the transponder and receive customer preferences or an ID, which will allow the dispenser or associated control system to access customer preferences, early in the fueling operation. Preferably, the information is accessed as the customer approaches the dispenser to enable the dispenser and associated systems to provide the customer with a personalized greeting, pre-selected information, such as news, traffic, weather, scores or stock reports in addition to providing customer selected advertising, merchandising or entertainment presentations. Typically, a customer fills out information relating to the types of information, greetings and multimedia presentations he or she would be interested in receiving during a fueling operation. The information is entered into a database associated with the transponder ID or actually stored on the transponder in a format capable of instructing the dispenser or central control system accordingly.

Reference is directed to Figures 26A and 26B. Once the customer preference infori-nation is in place, fueling processes will beprin (block 1500) wherein the dispenser 18 receives transponder identification indicia (block 1505). The dispenser 18 will cooperate with the central control svstern 50 and remote network 94 as necessary to receive and access customer preferences.

Alternatively, the preferences may be downloaded from the transponder directly. The preferences may precondition fuel delivery (block 1515) by selecting the desired type of fuel and fuel grade, and providing a personalized greeting (block 1520). The greeting may be configured to visually and/or audibly provide a message such as "good morning" or "good afternoon Mr. Smith." Additionally, a customer may have selected preferences as to the type of advertising and merchandising provided by the display 100 and audio/video electronics 86.
The advertising may come from a dedicated auxiliary audio/video source 156, such as a laser disk player or digital video disk (DVD) as well as via the remote network 94. The network 94 may be associated with the Internet. The Internet provides a wide range of multimedia capabilities to the fueling environment relating to remote control and information dissemination.

Attention is drawn to U.S. Patent application Serial No. 08/896,988 for INTERNET CAPABLE BROWSER DISPENSER ARCMTECTURE, filed July 18,1997, in the name of Russel D.

Leatherman et al. The disclosure of this application is incorporated herein by reference.

Similarly, the customer may elect to receive audio/video entertainment (block 1530), such as brief videos or music provided to make the customer's visit to the fueling envirom-nent more pleasurable. Additionally, the customer may elect to receive a wide variety of inforination relating to news., weather, scores, stock updates and traffic reports, just to name a few of the types of information available (block 1535). As noted, this inforination may be gathered and distributed locallv bv the central control system 50 or accessed via the remote network 94.

1 1
Associating the central site control system with the Internet will allow significant access to various types of inforination.

Given the tremendous amount of information capable of being provided at the dispenser based on customer selection or independent merchandising, the present invention also provides for suppressing the presentation of certain information as desired by the customer (block 1540).

For example, certain customers may not want to receive advertisements for tobacco products, alcoholic beverages or snack products. Preferably, any of the information may be suppressed upon customer election and use of the transponder.

In addition to suppressing available information, a customer is also provided the ability to change or override a preference previously elected during initial setup (block 1545). Typically, the customer is queried via a prompt on the video display 100 of the dispenser 18 to change or override a certain preference. Upon receiving customer input via the key pad 102, 104, the dispenser control system 80 (possibly in conjunction with the central control system 50) will override and/or change the information provided on the display 100. Changing the preference may include providing a customer with a menu of available information display options. Thus, the dispenser control system 80 will monitor the key pad 102, 104 for a customer response (block 1550). If the customer responds accordingly (block 1555), the preference is modified or changed (block 1560) by simply canceling the preference or selecting a new preference from a displayed menu. The preference may be made temporarily or permanently by updating the database and/or sending an appropriate control siprnal to the transponder. After the preference is changed, the dispenser will operate to continue the fueling operation (block 1565) until the operation comes to an end (block 1570). If the customer does not elect to change a predefined preference, the dispenser control system 80 will simply continue fueling until the end of the fueling operation (blocks 1565 and 1570). The dispenser may recognize other preferences to precondition the fuel dispenser for the impending fueling operation, including selecting a card type, payment method, account type, or other related transaction information to prepare the dispenser for fueling and carrying out the transaction. The customer may also elect to receive specific types of advertising and merchandising. Based on these elections, system operators may provide additional independent but targeted advertising and merchandising.

Preventing Fueling of Unauthorized Containers

The present invention may also provide for ensuring a container is proper for receiving and carrying fuel delivered by the dispenser 18. With reference to Figure 27, a dispenser 18 is shown having a delivery hose 76 and nozzle 78 for delivering fuel to a vehicle or other acceptable container 280. Preferably, the container 280 is a fuel container manufactured to reduce the risk of igniting the fuel carried therein. The container 280 includes a body 282 having a spout 284, filling aperture 286, handle 288 and a transponder 290. Although active or passive transponders are acceptable for this aspect of the invention, a passive transponder, acting as a true transponder, is preferable. The transponder 290 is designed to reflect an interrogation signal sent from the dispenser interrogator 52 under the control of the dispenser control system 80. Upon receiving the interrogation signal, the transponder 290 will transmit a signal indicative of the type of container and whether that container is acceptable for carrying fuel.

Attention is drawn to the flow chart of Figure 28 depicting the basic process of monitoring and detecting acceptable containers for fueling. At the beginning of the process (block 1600), the dispenser control system 80 will cause the dispenser interrogator 52 to transmit an interrogation

signal in order to interrogate the transponder 290 (block 1605). When a transponder is within the interrogation field, it will transmit a signal in response to the interrogation signal. The dispenser interrogator 52 will receive this transponder signal, which typically includes indicia of the transponder type or an identification indicia allowing the controller to access a database to determine the type of transponder in communication with the dispenser (block 1610). The transponder may indicate that it is a personal transponder carried by the person, such as a card or key fob, a vehicle-mounted transponder or, in this particular instance, a stand-alone fuel container. Whether the transponder signal directly indicates the type of container being fueled or a database is accessed based on the transponder ID, the dispenser control system 80 or an associated control system is adapted to determine if the container is acceptable for receiving fuel (block 1615). The transponder indicia or database may also indicate the type or grade of fuel for the particular container.

If the container is not an acceptable container (block 1620), the dispenser control system 80 will provide an audible or visual signal to the customer and/or operator indicating that the container is not acceptable for receiving fuel (block 1625). The dispenser control system 80 will also act to prevent fueling by deactivating the pump and fueling electronics (block 1630) and the process ends (block 1635). If the control systems determine that the transponder is in an acceptable container (block 1620), fueling is authorized (block 1640) and fuel delivery begins (block 1645). A proper container may be a vehicle fuel tank wherein the vehicle-mounted transponder 64 will enable the control system to recognize the vehicle as an acceptable container. In certain embodiments, the vehicle transponder 64 may be mounted on or near the vehicle's fill neck.

Preferably, the dispenser will continue communications with the -transponder to ensure that the transponder remains present during the fueling operation and, optionally, the dispenser may monitor movement of the transponder during this fueling operation (blocks 1650 and 1655).

If no movement is detected and the transponder is present throughout fueling, the operation will end once the container is full and the customer stops fueling. If the transponder is moved or leaves the presence of the interrogation field, fueling is brought to a halt (block 1660 and 1635).

If the transponder is moved and/or the dispenser determines that the transponder is no longer present and the fueling operation is in progress, the controller 80 may act to warn or instruct the customer accordingly in addition to halting the fueling operation. If the container 280 stops moving or is brought back to a proper fueling location, the dispenser 18 may be adapted to continue fueling as part of the same transaction. The proximity or location monitoring features of this aspect of the invention are discussed in greater detail above.

Restricting fueling to authorized containers in the manner described above greatly reduces the risk of severe bodily injury or death, not to mention substantial property damage that can occur when highly flammable fuels are carried in improper containers. In the preferred embodiment, the addition of a small passive transponder to a fueling container is minimal and modifying a dispenser 18 having an existing interrogator is basically updating software to recognize the information received from the transponder during interrogation. Notably, although a classical transponder is the preferred embodiment, as noted earlier in the

specification, a transponder is used in a most aeneric sense and is deemed to include remote communication units having a receiver, a transmitter, or a combination thereof.

Pre-transaction Estimates
The present invention may also provide pre-transaction estimates of the amount of fuel required to fill the vehicle's tank along with the estimated total cost of filling the vehicle. This embodiment requires a vehicle-mounted transponder operatively associated with a vehicle control system or, at a minimum, the vehicle's fuel tank in a manner wherein the transponder is able to receive or detennine information relating to fuel tank ullage. The ullage information may include the amount of fuel required to fill the tank, tank size and/or the quantity of fuel remaining in the tank. This information may be passed to the transponder and then to the dispenser, or used to generate data to be communicated to the dispenser. Ullage information is any type of information which relates to tank ullage or from which ullage can be derived.

The tillage here refers to the volume of the tank which can receive additional fuel.

Referring now to Figures 29A and 29B, the basic process of providing customer pre-transaction estimates with a vehicle transponder is shown. The process begins (block 1700) when a customer drives up to a fueling operation and the associated transponder is interrogated by the dispenser interrogator 52 under the control of the dispenser control system 80. Generally, the transponder will return identification indicia (block 1705). The transponder may also return indicia indicating the transponder type. Alternatively, the transponder type may be included in the transponder identification indicia or sent separately to enable the dispenser control system 80 or other associated control system to determine the transponder type.

As discussed above, deten-nining the type of transponder is helpful in many situations, such as detemiining whether a container is autliorized for receiving fuel or allowing a personal transponder to leave the immediate fueling position during a fueling operation, while acting to prevent a vehicle-mounted transponder from leaving the fueling position. The dispenser control system 80 or associated control system may also use the transponder identification indicia to access a database correlating the type of transponder with the identification indicia.

Distinguishing transponder types is discussed in detail in U.S. Patent Application Serial No.

08/966,237 filed November 7, 1997, entitled TRANSPONDER DISTINCTION IN A FUELING ENVIRONMENT in the name of William S. Johnson, Jr., the disclosure of which is incorporated herein by reference.

Regardless of the type of identification indicia transmitted to the dispenser 18, the dispenser control system 80 (in cooperation with other control systems, if necessary) determines the transponder type (block 171 0). Next, it is determined whether the transponder communicating with the dispenser is a vehicle transponder (block 1715). If it is not, the fueling operation will proceed (block 1795) and continue until fueling has ended (block 1785), wherein the process comes to an end (block 1790).

If the transponder is a vehicle transponder (block 1715), it is determined whether or not the vehicle transponder is an integrated transponder capable of accessing ullage information (block 1720). This

information is preferably derived from the transponder identification indicia and transponder type information transmitted to the dispenser. However, any manner of communicating this information to the dispenser is acceptable and within the inventive concept of the present invention. If the transponder is vehicle-mounted but not integrated to obtain ullage information, the fuelinpr operation will start (block 1795) and continue until fueling has ended (block 1785) wherein the process is ended (block 1790).

If it is determined that the transponder is integrated and adapted to provide ullage information (block 1720), the dispenser must determine whether the customer wants an estimate of the transaction amount (block 1725). Typically, the estimate will be associated with completely filling the vehicle's fuel tank. The customer may provide a request for the fill-up at the dispenser by entering a response on the key pad 102 based on a prompt or query displayed on the display 100 (block 1730). Alternatively, the transponder may relay information during communications with the dispenser indicating that the customer has pre-authorized the dispenser to calculate an estimate associated with fueling the vehicle (block 1730).

If the ullage information has not already been received during initial interrogation, the dispenser interrogator 52 will interrogate the transponder 64 for the ullage indicia (block 1735) and receive the ullage indicia accordingly (block 1740). Based on the ullage indicia, the dispenser control system 80 or associated control system will determine or calculate the vehicle's tank ullage based on the ullage indicia received (block 1745).

The ullage indicia may include the exact ullage value representing the amount of fuel required to fill the tank, or the ullage indicia may indicate tank volume and the amount of gas currently present in the tank, wherein the control system will run the appropriate calculations to determine ullage. In yet another embodiment, the ullage information may simply include vehicle identification and remaining fuel indicia, and the control system will access a database at the central control system 50 or at the remote network 94 storing information relating to tank size for the identified vehicle. Those of ordinarv skill in the art will quickly recognize various ways of obtaining ullage information. These ways are considered within the scope of this disclosure and any related claims which follow.

Once ullage is determined, the control system preferably determines or calculates an estimated cost of fueling the vehicle based on the ullage information. In order to do so, the type of fuel and fuel grade must be determined (block 1750). The dispenser controller may provide a prompt at the display 100 for the customer to select the type of fuel and grade desired for fueling (block 1755). Alternatively, the initial information received from the transponder may provide information on the ty e and grade of fuel desired for fueling, and the associated control
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system will determine fuel ty e and grade accordingIN 7(blocks 1750 and 1755).

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Once tank ullage and the type and grade of fuel are deten-nined, the associated control systems will calculate the estimated cost for filling the vehicle (block 1760) by multiplying the ullage value by the fuel cost. Preferably, the estimated fuel quantity and the cost for fueling the vehicle with the selected type and grade is displayed to the customer

on the display 100 (block 1765). At this point, the customer is given the option to continue with fueling. The customer may, for example, be provided with a prompt to begin fueling (block 1770) wherein the customer will respond by pressing a key on the key pad 102 (block 1775). If the customer elects not to fuel based on this information, the fueling operation is ended before it ever begins (block 1795). If the customer elects to continue fueling, the dispenser will start the fueling operation (block 1780) and continue fueling until the tank is full or the customer otherwise ends the operation (block 1785) wherein the process comes to an end (block 1790).

Determining estimated fuelinpr totals benefits customers in many ways, especially customers wanting to pay cash at the dispenser using the cash acceptor 90 (shown in Figure 3)). As noted earlier, the difficulty with cash acceptors is providing the customer with the proper change when the amount of fuel purchased is less than the dollar amount placed in the cash acceptor.

Providing an estimated amount required to fill the vehicle tank will allow the customer or dispenser to calculate a dollar amount which will not exceed an amount required to fill the vehicle. For example, the dispenser may determine that it will take $21.60 worth of premium, unleaded gasoline to fill the vehicle tank, If the customer only has two ten-dollar bills and a five-dollar bill, the customer will know that if the two ten-dollar bills are placed in the cash acceptor, he will come substantially close to maximizing the amount of fuel delivered to the vehicle without needing change.

Although the customer can elect to purchase any amount of fuel, it is often beneficial to determine how much fuel the vehicle will accept before determining how much fuel one wishes to purchase. In certain applications, the cash acceptor could be monitored to determine the amount of cash received and take appropriate action if the estimated filling total could not meet or exceeded that amount. In summary, the dispenser associated control system may detennine if change is necessary, based on the ullage information, the fuel selected and the amount of cash received by the cash acceptor.

Attention is drawn to Figure 30 wherein a process is shown for providing a customer with estimated cost totals in order to make decisions on the amount of cash to enter into a cash acceptor for payment. The process begins (block 1800) where the dispenser control system 80 receives ullage information, fuel type and grade as discussed above (block 1805). Based on this infon-nation, the amount of fuel necessary to fill the vehicle and a corresponding cost estimate is calculated and displayed to the customer (block 18 1 0). The customer may make fueling decisions based on this information, such as deciding what type of payment to make or how much fuel to purchase.

Assuming the customer is using a cash acceptor, the dispenser control system 80 will operate in conjunction with the cash acceptor 90 to determine the amount of cash payment (block 1815). If the payment made is less than the estimated cost of fueling (block 1820), then the dispenser control system 80 will allow fueling for the amount of payment (block 1825) until the operation is ended (block 1830). If the customer has placed more cash in the cash acceptor than necessary to completely fuel the vehicle (block 1820), the dispenser control system 80 will act to infon-n the customer that change will be required, preferably, using the display I 00 (block 1835). The dispenser control system 80 will next prompt the customer using the display 100 on how to receive change (block

1840). The customer may be required to receive credit on his or her transponder or go into the station store and obtain change at one of the transaction terminals, just to point out a couple of options. Additionally, the dispenser may provide a customer with the choice to opt out of the transaction (also block 1840). The dispenser control system 80 will determine whether or not to refund the customer's initial payment (block 1845) based on a customer input received at key pad 102 (block 1855). If a refund of the payment is not desired and the customer chooses to receive change by other means, fueling will begin (block 1850) until the process ends (block 1860). If a refund is requested by the customer (blocks 1855 and 1845), the dispenser control system 80 will cause the cash acceptor 92 to eject the customer payment (block 1865) and the process is ended (block 1860). Those skilled in the art should quickly recognize the added benefit in providing customer information before fueling relating to the amount of the potential fuel purchased, especially in light of the difficulties in receiving change associated with cash acceptors.

It should be recoprnized that the various aspects discussed herein can be mixed and matched to provide a fueling environment with various combinations of capabilities. Each aspect was discussed individually in order to provide a more clear disclosure. Furthermore, the various flow charts and processes disclosed herein generally represent programs which are stored in memory and run on an associated controller. Given the shared control responsibilities between the dispenser control systems and the central control system in a typical fueling environment, the control systems defined in the claims that follow are to be construed as including control features provided by dispenser control systems, central control systems and remote network control systems, alone or in combination. Those skilled in the art will recognize the tremendous flexibility in providing the various control aspects throughout the numerous control systems (including remote networks) in and outside of the fueling environment.

Certain modifications and improvements will occur to those skilled in the art upon a reading of the foregoing description. It should be understood that all such modifications and improvements have been deleted herein for the sake of conciseness and readability, but are properly within the scope of the following claims.

Claim

I A fueling system operable to conduct a prepayment transaction with a remote
communication unit said system comprising:
a. a wireless communication arrangement for communicating with said remote
communication unit;
b. a dispenser and customer interface for conducting a transaction;
C. a prepayment means;
d. a control system associated with said communication arrangement and said
dispenser;
e. said control system being adapted to
L determine a value correlating to a prepayment made by a customer at the prepayment means;
ii. effect storage of said value in association with the remote communication unit;
iii. communicate with the remote communication unit subsequent to effecting storage of the value; and
iv. deduct from the value an amount of a transaction associated with the.

remote communication unit to effect payment.

2 A fueling system as claimed in Claim I wherein said value is stored in a memory accessible by said control system and apart from said remote communication unit, said value bein2 stored in association with the remote communication unit. A fueling system as claimed in Claim 2 wherein said control system transmits said value to the remote communication unit for storage via said communication arrangement.
4 A fueling system as claimed in any preceding claim wherein the value stored for the remote communication unit is added to any prior value associated with the remote communication unit.

5 A fueling system as claimed in any preceding claim wherein said control system is adapted to alert a customer via said interface when the value stored in association with the remote communication unit is less than a predefined amount.

6 A fueling system as claimed in any of Claims 1-4 wherein said control system is adapted to alert a customer via said interface when the value stored in association with the remote communication unit is zero.

7 A fueling system as claimed in any of Claims 1-5 wherein said control system is adapted to alert a customer via said interface when the value stored in association with the remote communication unit is less than a transaction total.

8 A fueling system as claimed in proceeding claim wherein said prepayment means is a card reader associated with a card authorization network.

9 A fueling system as claimed in any one of Claims 1-7 wherein said prepayment means
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is a cash acceptor.

10 A fueling system as claimed in any one of Claims 1-7 wherein said prepayment means is an operator terminal apart from said fuel dispenser.

11 A fueling system as claimed in Claim 9 wherein said cash acceptor is apart from said dispenser.

12 A fueling system as claimed in Claim 8 wherein said card reader is apart from said dispenser.

13 A fueling system as claimed in Claim 9 wherein said cash acceptor is included in said interface.

14 A fueling system as claimed in Claim 8 wherein said card reader is included in said interface.

15 A fueling system as claimed in any preceding claim comprising a transponder which stores data relating to prepayments effected.
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T S5/3,K/121-150
>>>Item 121 is not within valid item range for file 813
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Set Items Description
S1 3 TRACKING (W) (CUSTOMER OR CONSUMER OR PURCHASER OR VISITOR

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            OR SUBSCRIBER) (W) (STORE OR SHOPPING )
S2          0   MONITORING  (W) MOVEMENT (W) (CUSTOMER OR CONSUMER OR PURC-
            HASER OR VISITOR OR SUBSCRIBER) (W) (STORE OR SHOPPING )
S3    6121674   MONITORING  (50) MOVEMENT (50) (CUSTOMER OR CONSUMER OR PU-
            RCHASER OR VISITOR OR SUBSCRIBER) (50) (STORE OR SHOPPING )
S4        237   MONITORING  (N50) MOVEMENT (N50) (CUSTOMER OR CONSUMER OR -
            PURCHASER OR VISITOR OR SUBSCRIBER) (50N) (STORE OR SHOPPING )
S5        118   S4 AND TRACK???
S6          0   (DELIVER??? OR TRANSPORT??? OR SEND??? OR BRING???) (W) (I-
            TEM? OR PRODUCT$1 OR GROCERIES OR GOODS) (W) (TERMINAL OR POS
            OR CHECKOUT OR CASHIER OR REGISTER)
S7          1   S5 AND (MOBILE (W) DEVICE)
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